

C W Report

Chemical Week

September 25, 1954

Price 35 cents



Postwar growth pulls chemical center of gravity southwestward; today's fulcrum: Ohio . . . p. 20

◆ **Foote's Bliss:** he puts a premium on science-wise salesmen, builds orders through research . . . p. 39

CW Report: 1953's research seeds yield bumper crop of 1954's new chemicals for industry . . . p. 49

◆ **Rubber Magic's top team pushes all-purpose liquid coating:** it's based on natural rubber . . . p. 106

New vitamin A synthesis sorts out structures, provides isomers for evaluation p. 122

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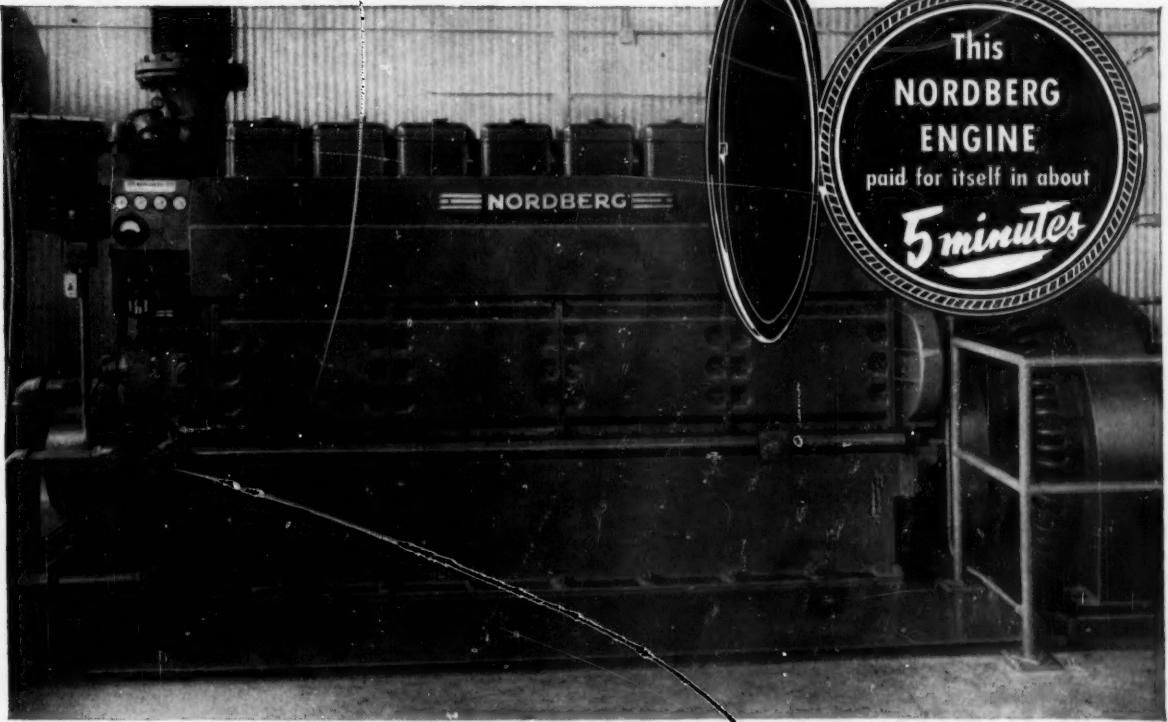
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Chemical Week—

Volume 75

September 25, 1954

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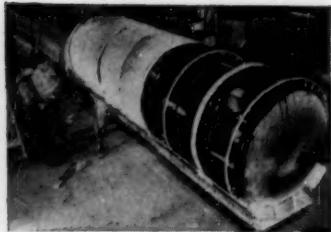
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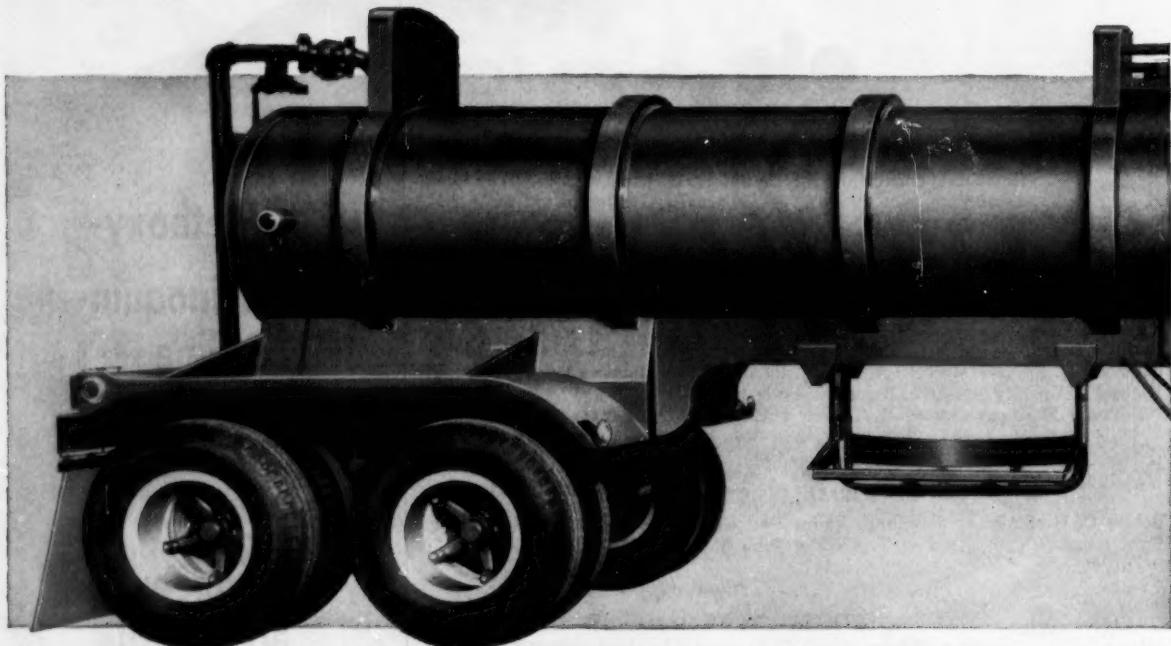
Rigid and continual inspection during assembly of Trailmobile Acid Tanks assure long service life, safe operation.

Continuous automatic weld gages can be seen on new acid tank under construction at Trailmobile's exclusive tank manufacturing plant, Springfield, Mo.



New Trailmobile Design

The New Model

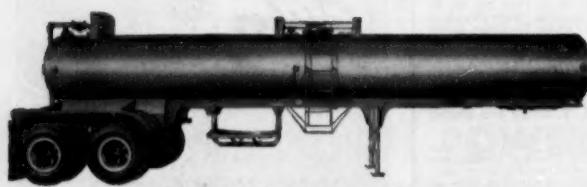


You can haul more in Trailmobile's new "slimmed down" Model CH Acid Tank Trailer. Model CH is lighter by thousands of pounds, without sacrifice of structural strength, load safety or road handling ease.

Trailmobile's weight-reducing secret is a strong tank shell of $\frac{3}{16}$ " A.S.M.E. Code Steel, girded by husky "rings of steel." Strong channel members (we call them exterior rings) are

welded integrally to the tank shell and sturdy supporting frame members. Result? Overall structural strength equal to all previous regulations! Amazing weight reduction!

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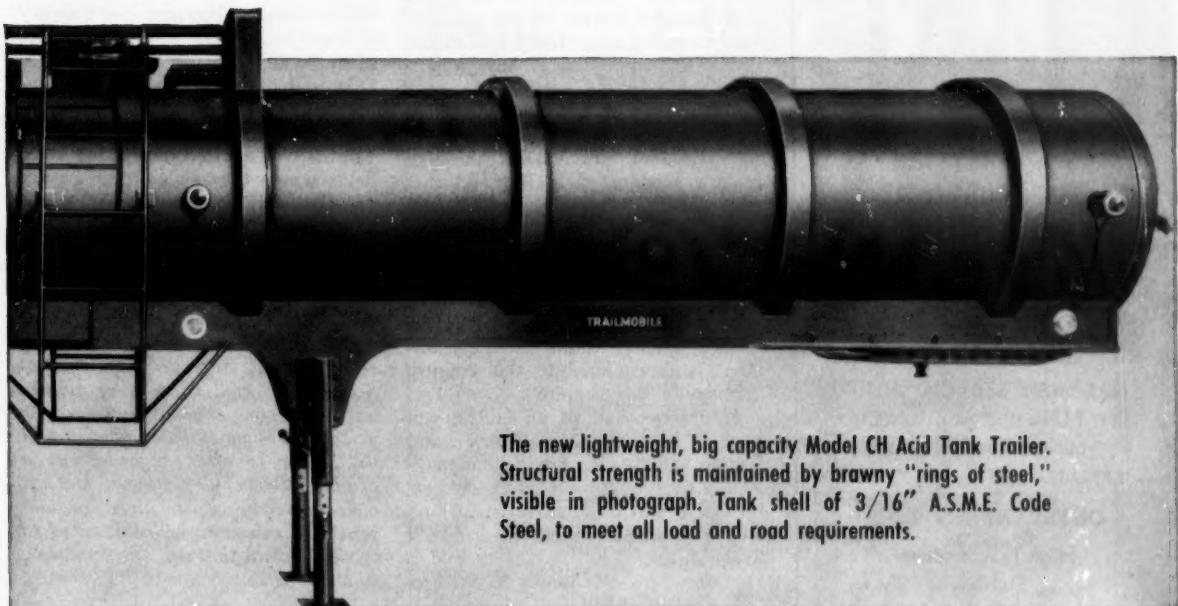
Model CH — insulated (optional)

Trailmobile continues to build heavier gauge tank trailers. Acid tanks are available in many sizes, shapes and designs with special and optional equipment to handle exact hauling problems. Ask about these special tanks.

Gives 3000 lbs. More Payload

CH Acid Trailer

... give you extra payload carrying capacity without sacrifice of structural strength or road safety!



The new lightweight, big capacity Model CH Acid Tank Trailer. Structural strength is maintained by brawny "rings of steel," visible in photograph. Tank shell of 3/16" A.S.M.E. Code Steel, to meet all load and road requirements.

tank weighs almost 3300 pounds less than before. You get a bonus of 3300 pounds more payload! What's more, the new Model CH acid tanks encompass every money-saving performance feature of previous Trailmobile models: Walkway mounting brackets; adjustable fifth wheel; full Class A vapor-proof enclosed wiring; wide tunnel drains for easy cleaning; the famous Trailmobile tandem, with 4', 6' and 9' options.

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OPINION

Fee . . . Fie . . . Fo . . . Fum

To THE EDITOR: . . . I am sending you, for your amusement, an editorial from one of our Canadian chemical magazines, which, although it refers to "some technical and business magazines in the U. S.—rarely in this country"—appears to be inspired by feelings against *CHEMICAL WEEK* . . .

The author of that criticism seems to be upset by your use of the English language . . . or, as he suggests, the way that it is enlivened . . .

He asserts, after quoting the Concise Oxford Dictionary to right and to left, that "while there has been some small following of this so-called modern word usage trend in Canada, it has not amounted to any proportion."

I'll agree with that . . . Although I am a Canadian, and although I hold some of our publications in high regard, I cannot help but feel that many of them are deadly dull and miserable to read . . . The passive voice, the pontifical phrase, the stilted sentence seems to be "the thing to use" . . . And, I might say, this tendency to cloak thoughts with cumbersome words and old-fashioned garnishments isn't confined to this country or even to this Empire . . .

I suppose that, as an editor, you have to have a tough hide . . . and I hope you do . . . I find your magazine refreshing, readable, understandable and informative . . . Don't let it become pedestrian—keep it lively . . .

GEORGE L. WILLYS
Sault Ste. Marie, Ont.
Thanks. Chaucerian English we may not always indulge in, but a sense of humor and—if needs be—a tough hide, we have.—ED.

Tobacco Target

To THE EDITOR: I noticed your interesting "Target" (Aug. 28) discussing cures for tobacco blights . . . You refer to different products of chemical manufacturers that are lightening the growers' burdens in this respect.

I hasten to add our Pestmaster methyl bromide to the list. This . . . soil-fumigant is participating in the tobacco growers' battle against weeds, nematodes and other insects, and various plant diseases . . . as well as in ridding other crops of many of their natural enemies . . .

THEODORE MARVIN
President
Michigan Chemical Corp.
St. Louis, Mich.
The products—which included methyl

bromide—and the companies we mentioned were, as we indicated, cited only as examples of who is doing what. But we're glad to mention Michigan Chemical, too, as a long-time supplier of methyl bromide—ED.

Statute for Traffic

To THE EDITOR: Your news article "Traffic Lights for Bigger Sales" (Aug. 21, p. 62) emphasizes a conclusion I reached several years ago when I resolved to get out of the traffic field.

In too many companies the traffic department is considered an obedient, passive sales servant. Until this attitude changes, business and industry will not realize the full potentialities of traffic departments.

If a man has the ability and intelligence to be a good traffic manager, he is capable of succeeding in (and is well-advised to turn to) other fields where the rewards are greater and the headaches less . . .

PAUL S. WEBER
Ramsey, N. J.

Said CW: ". . . Some chemical companies are finding that their best friend is their traffic manager . . . that there's a 10% controllable cost element in most large firms' transportation bills . . ." Clearly, of course, not every company has that view as yet, for as some traffic managers told us, "Ours is often regarded as a drudge service department and, if viewed merely as a passive, obedient servant it can scarcely be expected to originate plans that will effect savings, stimulate customer goodwill . . ."—ED.

Keep the Context

To THE EDITOR: Under the title "Safe Skin Soaps," Reader Jessop sends you comments that definitely indicate that he misunderstood your article "Synthetic Sore Spot" (July 24). First of all, the writer wishes to point out that he is a dermatologist as well as a toxicologist. Second, in all the papers he has written about toxicology of soaps and other chemicals, he has always used the word "toxicity" for internal toxicity (ingestion, inhalation) and the words dermatoses, dermatitis, primary skin irritation and cutaneous sensitization when external toxicity is

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to:
W. A. Jordan, Chemical Week, 330
W. 42nd St., New York 36, N. Y.

concerned. This appears very clearly in the resume and quotations published by CW in the paragraph: "Pertinent Points." Nowhere in my series of articles have I ever stated that in detergents "the main cause of irritation is a high pH" as the pH of cationics and nonionics is low; I mentioned the high pH of soaps.

Reader Jessop should realize that in order to comment accurately and impartially on a press abstract, he should have referred to the context. This would have prevented his making such statements as he made regarding potash soaps and antiseptics and to say that dermatologists "always say, use soap and water" when most of them wisely use neutral synthetic detergents in cases such as he mentions.

LOUIS C. BARAIL
Consulting Biochemist-Toxicologist
New York, N.Y.

DATES AHEAD

American Oil Chemists' Society, fall meeting, Radisson hotel, Minneapolis, Oct. 11-13.

National Chemical Exposition, Chicago Coliseum, Chicago, Oct. 12-15.

National Safety Congress and Exposition, chemical section, Chicago, Oct. 18-21.

Packaging Institute, annual forum, Roosevelt hotel, New York, Oct. 25-27.

Asn. of Consulting Chemists and Chemical Engineers, annual meeting and symposium, Belmont Plaza hotel, New York, Oct. 26.

Plastics in Building Conference, sponsored by the Society of the Plastics Industry, the Manufacturing Chemists' Assn., and the Building Research Advisory Board, National Academy of Sciences, Washington, D.C., Oct. 27-28.

National Paint, Varnish and Lacquer Assn., annual meeting, Palmer House, Chicago, Nov. 15-17.

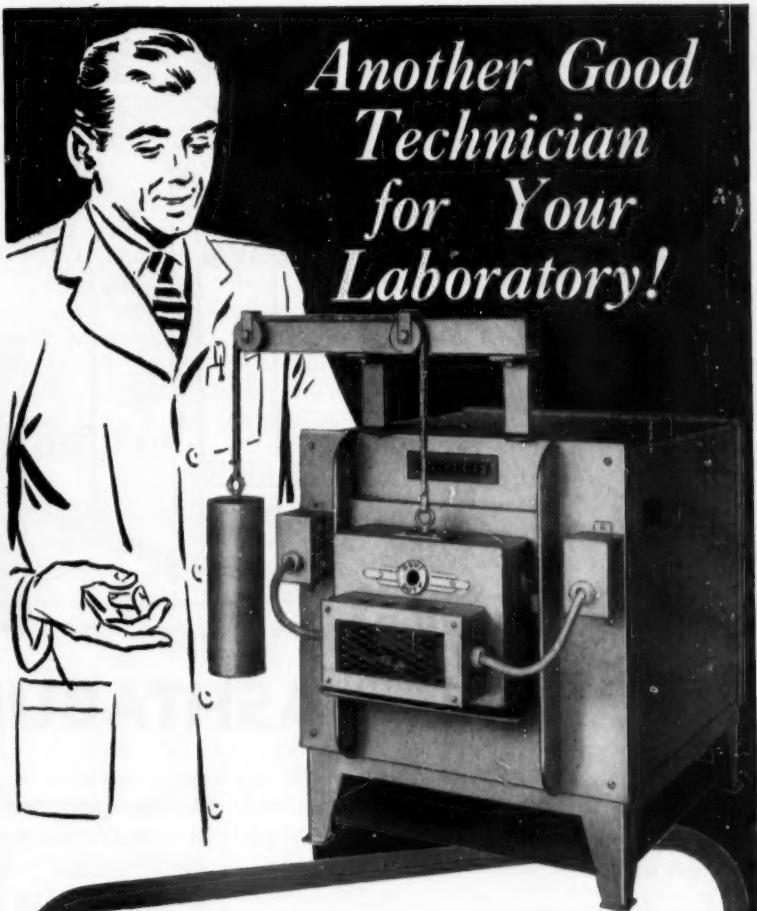
National Foreign Trade Council, annual convention, Waldorf-Astoria hotel, New York, Nov. 15-17.

Magnesium Assn., annual meeting, Chase hotel, St. Louis, Nov. 15-17.

Chemical and Plastic Industries Equipment Salon, Parc des Expositions, Paris, France, Dec. 2-12.

American Pharmaceutical Manufacturers' Assn., combined midyear and Eastern section meeting, Waldorf-Astoria hotel, New York, Dec. 6-8.

Chemical Specialties Manufacturers Assn., annual meeting, New Yorker hotel, New York, Dec. 6-8.



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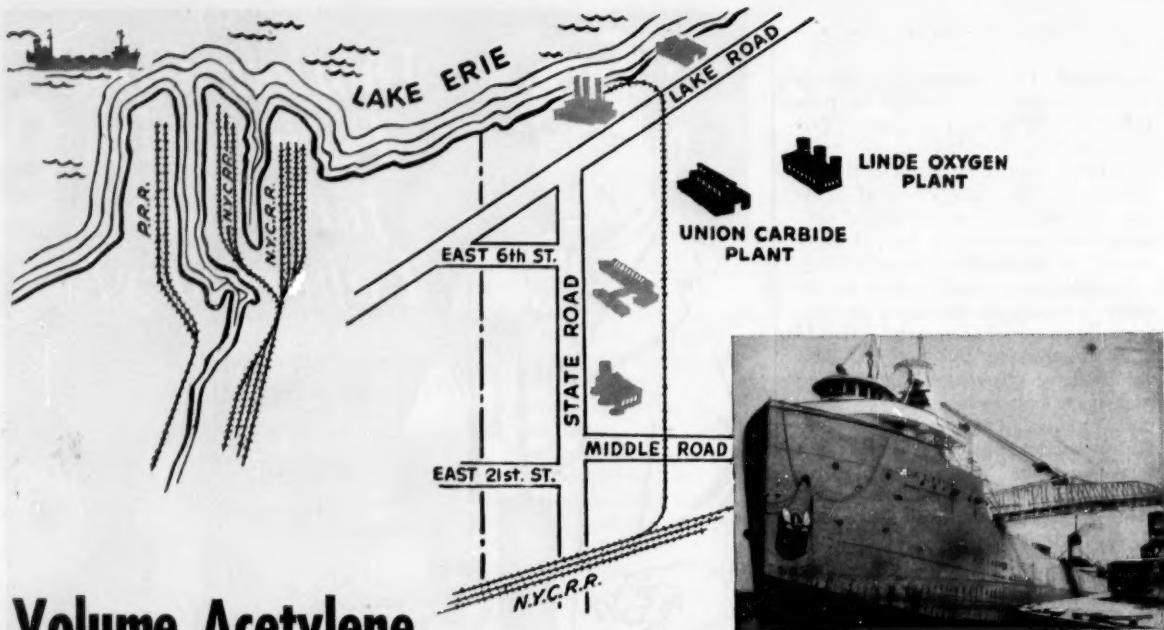
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Chemical Week

BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

NEWSLETTER

Official U. S. Tariff Commission figures, now out, confirm what industry people already know: that 1953 was all-in-all a good year. Data on synthetic organic chemicals—mainstay of the industry—show that output was up 15.5% over the previous year. But sales didn't fare so well: volume gained 8.7%, value only 6.5%.

Nor did all segments of the industry share the increase. Detergents and plastics registered large gains, but medicinals and agricultural chemicals lost ground.

Now the state with the most chemical manufacturing, New Jersey, has an air pollution control law. Signed last week by Governor Meyner, the act sets up a seven-member commission in the State Dept. of Health, directs it to study pollution and formulate regulations, and empowers it to enforce such regulations, and, if necessary, recommend legislation to the state legislature.

Expected to be enacted shortly is another bill providing for inter-state action on pollution by New Jersey and New York.

Launchers of new consumer products might well take some tips from Standard Oil of Ohio. To introduce its new "Boron Supreme" gasoline (see p. 123) it entertained (with a promotional show) and lunched 2,500 dealers and their wives in Cleveland last week, is repeating in four other Ohio cities this week.

It's also splashing full-page color newspaper ads around the state and using radio, TV and direct mail. Early next month an ad will break in *Life*—and incidentally inviting oil firms outside its marketing area to make and sell its boron gasoline.

That the two CIO unions in the chemical field will unite this winter is now an odds-on bet. At their convention in St. Louis last week, delegates of the United Gas, Coke & Chemical Workers voted 667-192 in favor of the proposed merger with the Oil Workers International Union. Next step will be up to OWIU, which will face the question at its convention in Cleveland starting Nov. 15.

While re-electing Elwood Swisher—a vigorous advocate of the merger proposal—to his second two-year term as president, the delegates put antimerger candidates into other top spots: Robert Buchanan becomes vice-president after his upset victory over Joseph Joy, and Cecil Martin starts his 13th year as secretary-treasurer.

Quebec's rapidly expanding mining industry is expected to score a "first" in lithium within a few months. Work is now in progress near Val d'Or, in Abitibi, to bring into production for export to the U. S. a vast underground deposit of spodumene. No lithium is produced in Canada at the present time, although the Abitibi ore body's existence has been known for many years.

The program being carried out by Quebec Lithium Corp., owner

NEWSLETTER

of the Val d'Or deposits, includes construction of a 1,000 ton/day concentrator near the ore body.

All concentrates produced in Abitibi will be shipped to a \$7-million refinery now under construction by Lithium Corp. of America at Bessemer City, N. C., and to its other plant at St. Louis Park, Minn.

Too little money—short of the required “full, fair value”—has been bid for the government-owned synthetic rubber facilities, thinks the commission responsible for their sale.

As a result, many firms have made new engineering and market studies with a view to raising their offers. Whether or not they have gone far enough will soon come out: new negotiations between bidders and the commission are taking place this week. The commission holds the aces in this game, for it can decide to “mothball” 42% of copolymer plant capacity if it considers the bids insufficient.

Another industry-government issue—compulsory licensing of atomic energy patents—may be refought in Congress next year. It's no secret that some Republicans voted for the Atomic Energy Act only with the understanding that the Joint Committee on Atomic Energy would tackle the patent problem as its first item of business next January.

If this fight waxes into a full Congressional debate, some Washington-wise experts fear a move to tie a similar compulsory licensing provision into rubber disposal. Such action, however, would require a Democrat-controlled Congress, since it would have to take the form of new legislation separate from the resolution by which Congress must approve rubber plant sales proposals.

Industrywide research has moved a step closer as the Manufacturing Chemists' Assn. has set up a committee to study possibilities of an independent chemical research center. MCA President William Foster acknowledged the move this week in a talk to the Industrial Health Conference in Houston.

The new committee will consider such problems as scope of activities, location, staff and financing. In unofficial discussions over a period of years, emphasis has been on a center for toxicological research—but the scope may well be broadened.

Food & Drug Administration is just as unhappy as citrus growers and chemical firms over the food color fracas (*see p. 15*): FDA has hinted that it would just as soon see an amendment to the law governing certification and use of food colors to give it some discretion.

As the law now stands, FDA has no choice but to disallow use if tests show that a coloring material is harmful—no matter at what usage level. The “quantitative safe level” concept now under discussion for food additives is considered a good model.

Possibility of such legislation may be behind the delay on the part of Secretary Hobby in decertifying oranges 1 & 2 and red 32.

Next week (Sept. 28) California's Central Valley Pollution Control Board will decide whether or not the Sacramento area will say “Welcome” or “Keep Out” to chemical industry. It will meet then to decide how far Ecusta Paper Co. may go in dumping wastes into the Sacramento River (*CW, Sept. 11, p. 23*), thus set the pattern for industry.

. . . The Editors

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BUSINESS & INDUSTRY

Titanium Gets Big Boost

Creating a stir of interest among chemical men last week, the General Services Administration signed a new titanium contract with Union Carbide and Carbon's Electrometallurgical Co., calling for construction of a \$31.5-million plant near Ashtabula, O. Capacity's listed at 7,500 tons annually; the project is to be privately financed; production's expected within two years.

Under terms of the deal, the government is committed to take any titanium produced—up to 6,000 tons annually—that Union Carbide can't sell on the open market, but at the same time gets an option to buy 4,500 tons annually at the market price at the time of delivery.

This latest move will bring U.S.-planned titanium capacity up 22,500 tons by 1957—leaves another 9,500 tons to be filled if the government's 35,000-ton expansion goal is to be realized. Other present CSA contractors: Du Pont (2,700 tons), Titanium Metals Corp. (3,600 tons), Cramet (6,000 tons), Dow (1,800 tons).

(More about titanium on p. 119.)

Handcuffs for GATT

Extremists from both sides were advocating (a) that the General Agreement on Tariffs and Trade should be strengthened, and (b) that this organization should be liquidated; but the chemical industry's position at last week's public hearing in Washington was simply that GATT be rendered harmless and powerless.

Testimony from the Synthetic Organic Chemical Manufacturers Assn. and the 65 other organizations represented at the five-day hearing now is being digested by officials from the State, Treasury, Commerce and Agriculture Dept.'s who will formulate the position to be taken by the U.S. delegates to the annual GATT meeting to be held in November at Geneva, Switzerland. After the conference with representatives of the 33 other nations that are members of GATT, any proposed changes in the organization's structure will be submitted to the U.S. Congress for approval or rejection.

SOCMA—a long-time champion of protective tariffs—presented at last week's hearing a statement calling for close limitations on the international



SOCMA'S WAGNER: For world trade group, a "talk, not action" role asked.

agency. SOCMA President Cary Wagner didn't appear in person, but he sent in a recommendation that the U.S. delegation hew to these principles:

- GATT should be a mere discussion forum, not a tariff-reducing body.
- GATT should have no substantive authority over the foreign trade policies or practices of its members; specifically, the U.S. should not, by participation in GATT, give up or limit its sovereign right to regulate its own commerce.

Among topics on the GATT agenda for the Geneva meeting: the rightness or wrongness of governmental subsidies for exporters, and the place of Japan in world trade. No specific tariff reductions will be negotiated, but there'll be a spirited campaign for a general tariff-cutting policy and for liberalizing import restrictions among member nations. This is in tune with the purpose of GATT, set up in 1948 to negotiate for freer world trade.

Although the hearing was intended as a means of getting detailed information and opinion on technicalities of possible amendments to the GATT pact, it proved to be more of a general debate on world trade policies. A few witnesses urged more support for the GATT method of boosting international trade, but most testimony was critical of the agreement. In the balance: the whole question of future U.S. participation.

Undersea Offer

The federal government is offering for lease, come Oct. 13, the first batch of offshore sulfur and oil-and-gas properties that it has made available since the tidelands oil bill was passed by Congress last year.

Involved are 108 sulfur tracts of some 5,000 acres each, and 199 oil areas three quarters that size, lying on the continental shelf off Louisiana. The properties are out beyond the area given to the state in the tidelands measure.

All companies bidding on the areas must pay a 7.5% royalty on sulfur sales. But leases will be awarded on the basis of a cash bid (called a "bonus") of at least \$15/acre. Annual rental or minimum royalty to be paid is \$2 for each sulfur acre.

Oil and gas royalty rate will be 16.67%, with minimum yearly royalty on annual rental of \$3/acre. As in the case of sulfur, minimum cash bonus is \$15/acre.

The areas up for leasing were chosen by Dept. of Interior officials on the basis of company requests made last June. Interior, at that time, invited companies to specify the areas off Louisiana that they would be interested in leasing. Since then, a similar invitation has been issued covering sulfur and oil and gas lands located on the Texas continental shelf.

As yet, there's been no decision as to what areas will be included in the next leasing offer—they may be Texas, or more Louisiana lands.

While the current offer is the first to be made under the tidelands law, there are already some oil and gas producers on federal land.

Areas on which these wells are located were first leased by the state of Louisiana, before Congress defined the areas to be managed by state and federal governments.

While this point has been ruled on by the Congress, it's far from settled. The state of Louisiana—which claims all land within 10.5 miles from the Gulf Coast shoreline—says it will go to court to prevent federal leasing of offshore tracts between the 3-mile and 10.5-mile lines.

State Mineral Board Chairman Wesley Clanton calls the U.S. plan a "threatened encroachment on Louisiana's sovereignty."



EXCHANGING VIEWS: Chemists Eckweiler, Kenney, Methods Div.'s Schnopper.

Behind the Tariff Scene

"Our country! In her intercourse with foreign nations may she always be in the right; but our country, right or wrong."—STEPHEN DECATUR.

Just say "tariff" to any group of chemical men and you're sure to come up with a variety of opinions ranging all the way from the superprotectionist to ultra free trade. Utter the word in front of a group of congressmen and you're bound to stir up a boiling argument. And, more often than not, the views of government men and businessmen will be in rugged opposition.

But there's one arm of the government whose employees—steeped though they are in tariffs—look at the whole tariff wrangle matter-of-factly. The scientists working away in the Bureau of Customs neither recommend nor draft legislation. They just see that the laws—be they right or wrong—are enforced. And right now they're busy and especially concerned with checking and rechecking on chemical imports and exports.

Largest customs laboratory in the country is the New York unit (44 employees); and it's biggest problem is to trap the shipper who misclassifies his goods so that he can slip in under a lower-than-should-be tariff.

Nor is snaring the wily tariff-evader easy. Chemical analysis doesn't always provide the evidence needed. So now the Customs sleuths are using a new "policeman"—a North-American Philips' X-ray diffractometer.

Chief chemist Kenney revels in the detection abilities of his X-ray eye,

points to these recent examples of might-not-have-been-uncovered evasions:

- A cargo, labeled as steatite ware (essentially magnesium silicate) turned out to be aluminum silicate under X-ray analysis.
- Phosphate shipments were really phosphates and pyrophosphates.
- Mercury benzoate imports were mixtures of mercury benzoate and mercury sulfide.
- Material vaguely designated as "air purifier" turned out to be sillimanite.
- Metal sheeting, believed to have a silver oxide coat, did not show up as such on the diffractometer.
- A product simply tradenamed "Blanket 1A" analyzed as sodium hydrosulfite.

Significantly, too, the diffractometer reversed court decision. An importer had declared his shipment as zirconium oxide (entitled to free entry). Chemical analysis showed, but not convincingly enough, that the material was not as claimed. The importer contested the Custom's Laboratories claims, won from the court a decision that his own declaration should be accepted. Later, however, a diffraction pattern showed cubic rather than monoclinic crystals. That meant stabilized zirconium oxide—dutiable at 15%—rather than ordinary oxide. Result: a reversal of the court's ruling.

Apart from its day-by-day scrutiny of all sorts of chemicals—running the gamut from essential oils to narcotics, the New York laboratory acts as ad-

viser to customs officers in New York State, parts of New Jersey, Connecticut, Puerto Rico and the Virgin Islands. (Last year alone the tariff revenue involved soared to several hundreds of millions of dollars from imports clearing just the ports of New York, Newark and Albany.)

The New York operation, while the largest, is otherwise typical of the customs laboratories throughout the country. Other major laboratories are at Boston, Philadelphia, Baltimore, Savannah, New Orleans, Los Angeles, Chicago and San Francisco. Sub-laboratories are located in San Juan, Puerto Rico, and Honolulu, Hawaii, operate with New York and San Francisco, respectively.

New York's Customs Laboratory (including San Juan) tested 26%—a full quarter—of all 100,000 samples coming under Bureau of Customs scrutiny during the last fiscal year; and revenue obtained from this port alone was about half that of the entire country.

Next largest work-load was handled in Boston (20% of all samples tested). New Orleans ranked next (13%), with Philadelphia (9%), San Francisco, including Honolulu (8%), Baltimore and Chicago (7% each), Los Angeles (6%), with Savannah (4%) rounding out the total.

Proud though it is of its activities as an apprehender of the duty dodgers, the laboratory is even more proud of its role as a guardian of the interests of legitimate industry. For, as any Customs man is quick to point out, "we have to be vigilant to thwart the illegal shippers who could, otherwise, compete unfairly with those companies who operate well within the law."



TEST: Chemist Ketchem, New York Customs Lab, readies X-ray diffractometer.

Green Light

The nation's first columbium-tantulum mine will be developed under a contract now being worked out between General Services Administration and Baker Bros., Boise, Idaho. The agreement being negotiated is a five-year, floor-price purchase contract covering over 1 million lbs. of combined pentoxides.

The U.S. now produces less than 1% of its columbium-tantalum requirements—wholly as a by-product of bauxite, pegmatite, and other minerals. According to Baker Bros.'s claim, the Idaho mine could produce enough to meet almost 40% of domestic needs.

Right now, over 90% of the world's production of both metals comes from Nigeria and the Belgian Congo. Idaho deposits, however, are estimated to contain 10 million lbs. of metal.

Chemists in Gotham

Hitting New York City in the wake of the recent hurricanes were some 13,000 chemical folk, intent on attending the 126th national meeting of the American Chemical Society.

That their handiwork can, in a constructive way, exceed a hurricane's impact on men's lives was proclaimed in the more than 1,350 technical papers presented during the five-day feast of data from industrial, college and governmental laboratories. Subject of these reports ranged from "Microbiological Aspects of Radiation Sterilization of Foods and Pharmaceuticals" to "Surface Treatment of Hydrated Silica Pigments for Reinforcement of Rubber Stocks," also included such topics as chemical industry resources in the South, know-how economics, and marketing new plastics.

While this "looking forward" mood prevailed throughout the technical programs running from 9 a.m. to 5 p.m. each day, some of the evening events brought a shift to reminiscing. At the Sunday evening dinner in the Statler hotel's Grand Ballroom, members of the ACS Div. of Chemical Marketing & Economics and members of the Commercial Chemical Development Assn., in joint fraternal session, heard Carbide and Carbon Chemicals President Joseph George Davidson recount his chemical salesmanship memoirs of 30 years ago; and when ACS President Harry Fisher presented the 18th Priestley Medal to the University of Rochester's Professor W. Albert Noyes, Jr., the honoree retraced the progress made in photochemistry since he wrote his first paper in that field in 1923. Noyes also commented that while great advances have been realized in science, the U.S. now is passing



ROCHESTER'S NOYES: In science, progress; in society, retrogression.

through an era of suspicion that he feels is "like a throwback to the trying period in the nation's early days when Americans suspected Americans and when foreigners were often viewed with alarm."

Surge in South: At the symposium on "Resources for the chemical industry in the South Atlantic States," speakers summed up the region's present and future development like this:

- **Industrialization:** Edwin Cox, vice-president of Virginia-Carolina Chemical Corp., called these eight states "the world's synthetic fiber center, one of the organic chemical centers of the nation, and a principal source of supply for cellulose and pulp." With about 14% of U.S. population, these states turn out 26% of the country's sulfuric acid—"the recognized index of chemical production and industrial activity."

- **Research:** Already well on its way in the northern part of the South Atlantic area, industrial research is just beginning to develop in the deep South and all signs indicate that it will expand rapidly, declared Professor Allan Gwathmey of the University of Virginia, winner of the society's Southern Chemist award in 1952.

- **Finance:** A relative shortage of capital—a reflection of low income levels—for a long time was a drag on economic development of the region, said Edward Wayne of the Federal Reserve Bank at Richmond; but "the picture has changed dramatically in the past 20 years insofar as the financial resources of the region are concerned."

- **Growth factors:** Dean S. M. Derrick of the University of South Caro-

lina's School of Business Administration pegged the area's industrial growth prospects on availability of raw materials, rapidly growing markets, and a good labor supply."

Conventioneers and their spouses found the city's "Great White Way" as dazzlingly bright as ever, in welcome contrast to the steady fare of cool, drizzly weather and overcast skies that also sojourned in New York during the convention. Sandwiched in between scientific symposia were tours of 15 plants, including three defense plants under security regulations. Firms that were hosts for these plant visits: Anheuser-Busch, Newark; Bell Telephone Laboratories, Murray Hill, N.J.; Boyce Thompson Institute for Plant Research, Yonkers, N.Y.; Brookhaven National Laboratory, Upton, N.Y.; Celanese Corp., Summit, N.J.; Consolidated Edison, New York; The Dorr Co., Westport, Conn.; Allen B. Dumont Laboratories, Clifton, N.J.; Fisher Scientific, New York; General Foods, Hoboken, N.J.; Hoffmann-La Roche, Nutley, N.J.; National Dairy Research Laboratories, Oakdale, N.Y.; Shulton, Inc., Clifton, N.J.; Foster D. Snell, Inc., New York; and Standard Oil Development, Linden, N.J.

In addition to those plant tours, there was plenty of travel for delegates right within the convention, which straddled a 29-block swath of midtown Manhattan from Pennsylvania Station up to Central Park. With as many as 28 different sessions going on simultaneously in the convention's 11 scattered hotel headquarters, one delegate confided to CW: "I've been shuttling from one hotel to another, chasing back and forth like the proverbial feather merchant."

Dither Over Dyes

Orange growers as well as chemical companies are showing keen concern over the Food & Drug Administration's move to ban the use of three coal-tar colors: red 32, orange 1, and orange 2 (CW, Aug. 21, p. 28).

Decertification of a coal-tar color is without precedent, and there's been some worrying about what this case will mean in the future if the FDA order is signed by Mrs. Oveta Culp Hobby, Secretary of the Dept. of Health, Education & Welfare.

But what has Florida citrus people disturbed is the fact that they've been using red 32 to impart an attractive color to the skins of their oranges. If that color is banned they feel they'll be at an economic disadvantage compared to orange growers in California and a few Florida localities, where the oranges do not need artificial coloring.

BUSINESS & INDUSTRY . . .

They're afraid it may take two or three years to develop a satisfactory substitute — although it's understood that at least one large chemical company is pushing research now on an oil-soluble red dye that might do the trick.

One point on which the orange growers are attacking the proposed decertification order: FDA's anxiety over the alleged toxicity danger point, said to be reached upon eating 350 oranges, with the skins.

Confronted with the Floridians' arguments, Mrs. Hobby has asked her new assistant secretary, Bradshaw Mintener, to study the evidence.

EXPANSION . . .

Petrochemicals: The Standard Oil Co. (Ohio) will build its \$17-million petrochemical plant on its Lima, O., refinery property. Construction work will get under way Nov. 1, and operation is expected to begin a year hence.

A substantial portion of Sohio's raw material supply will be by-product hydrogen from the company's new catalytic reformer unit—about to be put in operation at Lima. The remainder will come from natural gas.

Furfural: T. N. Peck & Associates, Inc., San Francisco, Calif., will build a \$3-million charcoal and furfural plant near Burnside, Ky. Construction has been scheduled for completion late next spring. According to T. N. Peck, president, the plant will be a glorified sawmill, will use "wood of any species to produce charcoal briquettes," then recover waste gases for conversion into furfural.

Magnesium: The Dow Texas Div.'s new magnesium recovery plant is now in operation. It will recover 2 million lbs. of the metal annually from previously discarded magnesium-electrolysis sludge.

Hydrogen: Newport Industries, Inc.'s new hydrogen unit at Pensacola, Fla., is now operating.

COMPANIES . . .

Monsanto Chemical Co. is reported to be leasing land between Sisterville and Moundsville, W. Va., as a possible site of its proposed di-isocyanate plant, to be built in collaboration with Farbenfabriken Bayer. No details on the move have as yet been issued from St. Louis.

Headquarters of Western Electro-

chemical Co. have been moved from Los Angeles to Henderson, Nev. Reason: a closer integration of administration and production units. Present plans call for construction of a new administration building in Henderson.

This latest move follows close on the heels of the news that American Potash and Chemical Corp. has acquired a minority interest in WECCO through a stock purchase, but officials claim it signals no forthcoming change in company ownership.

Hooker Electrochemical Co. directors have called a special meeting of stockholders to act on a proposal for a three-for-one stock split. If passed, the plan will call for issuing two additional shares for every share held of record Nov. 16.

Procter & Gamble Co., Cincinnati, has finalized arrangements (through its Canadian subsidiary) to purchase the assets and properties of Victory Mills, Ltd., Toronto. Victory Mills's principal operation is crushing soybeans. Capacity: 12 million bushels annually. P&G officials say the purchase is in line with a company policy to enlarge Canadian activities.

Incorporation papers have been filed by Numico Corp. in Bowling Green, Ky., to prospect for minerals—principally uranium—in Utah. Mineral rights to 4,160 acres have been acquired; the company will start operations with paid in capital of \$1 million.

Winthrop-Stearns Inc., New York, has chosen a site at Menlo Park, Calif. (25 miles south of San Francisco) as its future West Coast headquarters. Construction of the administration building will start immediately, is expected to be completed by early 1955.

American Cyanamid Co. has purchased approximately 1,000 acres of land between Bartow and Fort Mead, Fla., for a price in excess of \$700,000. Cyanamid, with Florida headquarters in Brewster, already has extensive phosphate holdings in the area.

W. R. Grace & Co. will integrate operations of its subsidiaries—Thurston Chemical Co. and Naco Fertilizer Co.—into those of Davison Chemical Co. Joplin, Mo., will become Western headquarters for Davison, as well as for Thurston and Naco plants.



LATEST APPOINTEE TO AEC

LATE LAST WEEK President Eisenhower named a new member to the board of the Atomic Energy Commission. The appointee: Willard Frank Libby, 45, University of Chicago atomic scientist. He will

succeed Henry DeWolf Smyth, connected with early atomic bomb research and author of the popular Smyth report. Dr. Smyth's letter to the President gave no reason for his resignation, effective Sept. 30.

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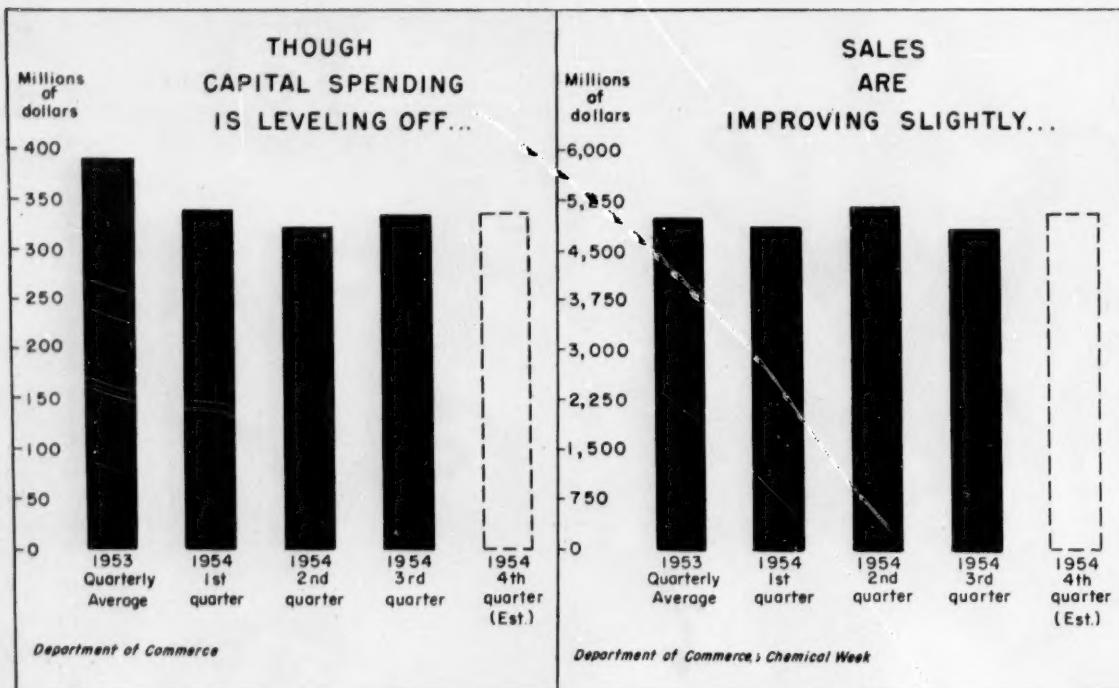
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From Any Angle, A Satisfying View

Like seafarers who've battened down for the hurricane that never blew, the chemical industry this week is cautiously reassessing its position. From almost every vantage point, it looks as though the economic contractions of 1953 have come to an end; business right down the line shows signs of picking up again. Higher sales, predicted for the fourth quarter, may even lift total 1954 sales up to 1953 levels.

That in itself would be welcome news to chemical management. But arousing even more joy among those who had dolefully predicted an extended recession is the realization that the industry—in its first brush with heavy weather since the war—has shown remarkable resistance. Capital expenditures, for example (see graph above), slipping off some 15% from the all-time 1953 peak spending level, have virtually leveled off, but at a very high plateau. And best estimates for 1955 indicate that it will very probably continue to parallel present rates.

"The result," points out one company president, "is that the chemical industry can look forward to a year of high business activity." No serious or long-extended decline has ever taken

place when construction was going ahead at a high level. Moreover, industry surveys indicate that by 1970—from current expansion plans alone—production of chemicals will have risen 150%.

The mood of cautiously growing optimism has been reflected in slowly rising sales too. Though disappointed by third-quarter drop-offs, most chemical men polled by CW are predicting that sales in the fourth quarter of 1954 will be ahead of the average quarter in '53 (see graph above) "will continue to rise gradually through the first two quarters of 1955."

Brightest in Spots: Taking a longer-range look, prospects for several sectors of the industry are particularly bright. Production of plastic materials, for example, should top 6 billion lbs./year by 1970, compared with 2.8 billion lbs. last year. And output of synthetic fibers (after a shaky few years) could easily triple by the same year. Agricultural chemicals, too, despite the oscillations of recent seasons, can be counted on to double in sales by 1970.

Industrial chemicals, management agrees, are pretty well consigned to track along with the general growth in industrial production. But even

here, there's a strong reflection of confidence among top company officials. Investment in petrochemical plants, according to present plans, should register the sharpest growth in the immediate future. Chemical companies will invest some \$6 billion in new facilities within the next six years—with expenditures averaging \$500 million/year.

More Modernization: Many leading chemical companies, however, admit their capital expenditure programs for 1955 are currently being revised "with a shift in emphasis toward plant modernization." Reason: "It's somewhat safer to modernize present equipment with funds currently available and to defer new projects pending the anticipated fall recovery in sales."

"It's all a question of timing capital expansion plans now," admits one basic chemical producer. "We're all sure that industrial activity is heading upward again, but not many of us are sure enough to risk outside financing until a few more good months have passed. Meanwhile, we're working on improving present facilities."

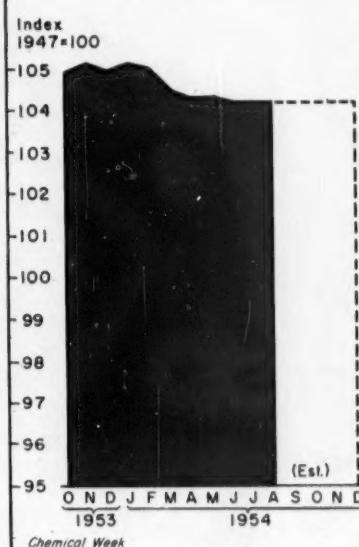
Inventories Inch Up: Most chemical producers point to the fact that inventories are inching up again as

further proof that executives are now firmly convinced there's smooth sailing ahead. "You wouldn't see an inventory build-up of any kind," notes a plastics vice-president, "if we weren't sure that it's just a case of putting up with production running ahead of sales for a short while. The drive was on to liquidate inventories just a year or so ago when it looked as if a major business decline was in the offing. But today it's a different matter. The mild inventory build-up isn't bothering anyone much because we're all sure that increased demand lies just ahead."

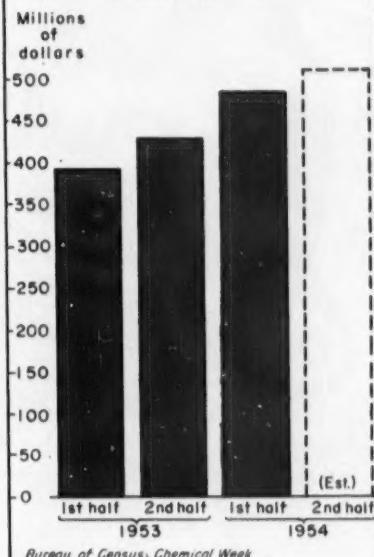
That prices have held steady for the past several months is another encouraging factor. Currently, chemical prices average only 1% below a year ago—and are paralleling the course of industrial prices generally. "Although we may still experience some price cutting in fabricated metal products," notes one observer, "it's unlikely that the price average in any other major category will fall much; if anything the outlook in the months ahead is from steady to rising."

Exports Picking Up: Of all the various phases of chemical activity that have registered changes in recent months, none has been as bullish as chemical exports. It now appears that exports of chemicals in the last six months of 1954 will top first-half records by a substantial margin, and that the year's total will run over \$1 billion. That, (see graph above) would mean a 20% increase over 1953.

... PRICES ARE HOLDING FIRM...



... AND EXPORT TRADE IS PERKING UP



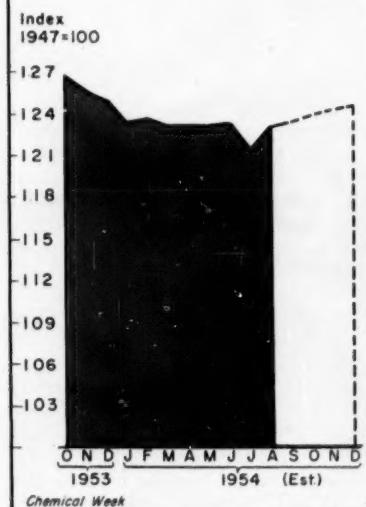
Greater Flexibility: Also mirroring pleasant prospects for 1955: many chemical producers are pointing to the recent changes in the tax law (which permit flexible depreciation of capital expenditures) as virtually guaranteeing a stimulus in expansion projects. "With the opportunity of writing off (for tax purposes) two-thirds of a capital expenditure in the first half of its life," says one company controller, "management can improve its cash position at the same time that it's maintaining a high level of plant improvement or expansion." Not many ("even the stubborn holdouts") will long fail to take advantage of the situation. "And that, more than anything else, convinces us that we can expect a healthy business improvement next year."

But the actual economic impact of flexible depreciation allowances isn't quite as attention-commanding to all chemical men yet. Some are closely watching labor statistics, "which point up that companies have weathered the recession blow."

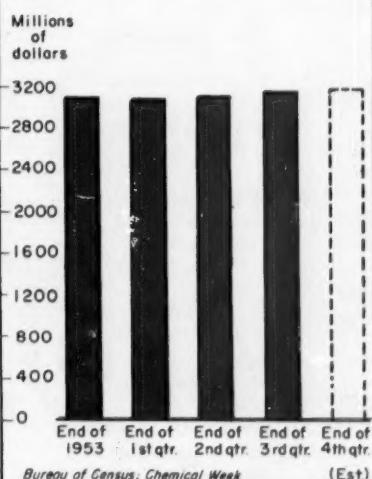
Such evidence is forthcoming in latest figures on employment in the chemical process industries, which showed an upturn last month to a total of 774,600, according to the Bureau of Labor Statistics. Even more of a pick-up was noted in the chemical production and maintenance arena. Because of increasing mechanization and owing to market conditions, this figure had dipped by 8.0% from its 1953 peak to a July '54 low; but last month, the industry's hourly paid force rose by 3,000 to an estimated 516,700.

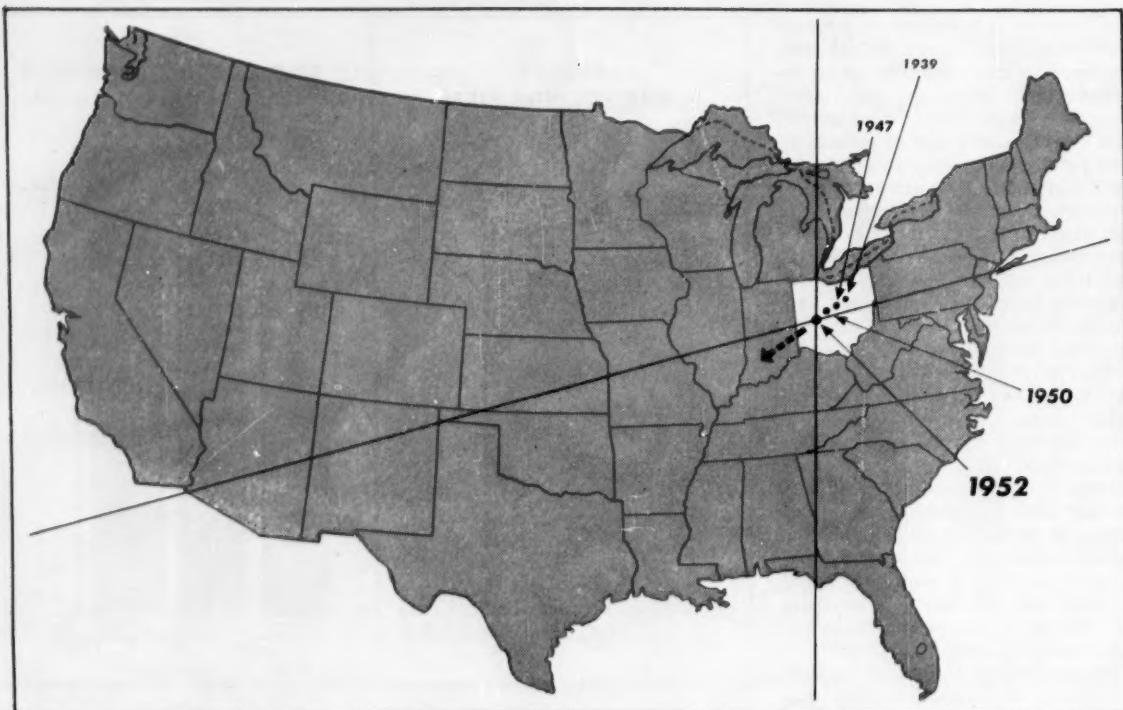
This strengthens the present outlook: a zestful fourth quarter, with business then taking a more gradual upgrade in the first half of '55.

THAT MEANS OUTPUT IS TURNING UP AFTER A SUMMER LULL...



AND INVENTORIES ARE INCHING UP AGAIN





NATION'S CHEMICAL QUARTERS: In each sector, 25% of yearly production value; near Orange, O., the industry's . . .

Rolling Center of Gravity

"Westward Ho" is even more descriptive of the U. S. chemical industry today than it was of the American people during the pioneering days of the 19th century.

A CHEMICAL WEEK survey, completed last week, shows that the "center of gravity" of the chemical process industries now is in west-central Ohio, having been roving south and west at the rate of more than 7 miles/year since 1939 (*see map, above*). By comparison, the country's center of population shifted westward at about 5 miles/year between 1800 and 1900, and since then at about 2½ miles/year.

Thus the chemical industry is, as it were, following the population, but moving more rapidly. However, the center of population at the time the 1950 census was taken was some 330 miles farther west and 104 miles farther south than the center of the country's chemical industry; so at their present rates, it would take more than 70 years for the two dots to coincide. Even then, they'd still be east of the nation's geographical center, which is in Kansas.

Western Sites Beckon: To chemical companies, this has significance because of its implications for location of

future plants, warehouses, and sales headquarters—particularly in view of the fact that the chemical industry is its own best customer. In just 13 years, the states west of the Mississippi River increased their share of the country's chemical production from 16% in 1939 to 25% in 1952; and the proportion is increasing.

Naturally, there are factors that will tend to brake the westward drift of both population and industry; but their full effect won't be felt for some years to come. Despite the deserts and mountains, all the Western states can support and are attracting more people and more industries; this is somewhat offset by the obvious fact that Eastern states too are still growing.

Probably the biggest single magnet pulling the chemical center west and south: the prodigious rise of petrochemical production in Texas, Louisiana and California. This has outtugged such powerful opposing forces as a more than 300% increase in the chemical output of the East's Middle Atlantic region (New York, New Jersey, Pennsylvania).

On All Fronts: All this has to be viewed against a backdrop of a tremendous jump in chemical production

for the country as a whole—namely, nearly 340% for that same 13-year period. For the states east of the Mississippi, the rise was 296%; for the Western states, 564%. Employment in the entire chemical process industries went up by more than 72%—in the east, 68%; in the West, 92%.

More than half of the nation's chemical production still comes from the 14 states in the Northeast, but the other sections are moving up. The 16 Southern states now produce about one-third of all U. S. chemicals, leaving only about one-seventh of total chemical production to the other 18 states that have more than half of the country's area.

This means that while chemical companies still tend to bunch up in favored locations, there are now so many of those preferred localities that the industry as a whole has attained a fairly high degree of dispersion. From the standpoint of national defense in a possible atomic war, there's still much to be desired in terms of spreading out away from potential target sites, however.

Receding Recession: While current expansion projects have bolstered chemical employment in some sections of the country, employment totals in the East were nibbled by the recent recession, tending to make the West and Southwest look even more

booming by comparison. Even so, it's worth noting that chemical employment is reported up by 27.8% in the St. Louis vicinity over the past seven years; Arkansas figures its chemical employment is up by nearly 80% over that same period; Texas and California both claim increases of more than 20% in the past four years; and in Nebraska—where a few good-size chemical plants are just beginning to move in among the farms and ranches—chemical employment is up by nearly 70%.

Not that the Eastern states have been standing still, by any means. Each of the nation's six top states in the production of chemicals—all of which lie east of the Mississippi and north of the Mason-Dixon line—registered gains in chemical employment in recent years. These figures are from the U. S. Commerce Dept.'s census of manufacturing:

State	1950	1952
New Jersey	74,227	79,448
New York	67,154	73,503
Illinois	49,162	49,946
Pennsylvania	40,022	44,595
Ohio	38,909	42,101
Michigan	32,248	36,652

Together, these six states account for nearly 47% of the nation's total chemical employment. Adding in the four next largest state totals—for California, Texas, Virginia and Tennessee—would bring the 10-state figure to

two-thirds of the national total.

Plant Investments Up: Another key to the trek of industry across the plains is the increase in capital investment in the Western states. Admittedly, plant investments in the prairie and mountain states are still small compared with chemical property values in the highly developed Eastern states, but the Western chemical build-up, just beginning, appears to be off to a fast start.

In Utah, for example, the state university's Bureau of Economic & Business Research estimates that \$12 million was put into chemical process plant expansion during 1947-50; another \$6 million during 1951-53; and that if plans firm up for new fertilizer and other chemical plants, expenditure of another \$14 million may come during 1954-56.

At the same time, expansion is continuing in the East: during the past year and a half, chemical firms laid out some \$75 million for construction and modernization in Virginia, and construction of three big new chemical fiber plants in South Carolina will hike capital investment there by about \$185 million.

One point demonstrated by the chemical companies' westward advance: in an expanding economy and a technological age, this industry has been quick to spot new demands, new markets and new opportunities, and to adapt itself to rapidly changing realities of a mighty nation's economic geography.



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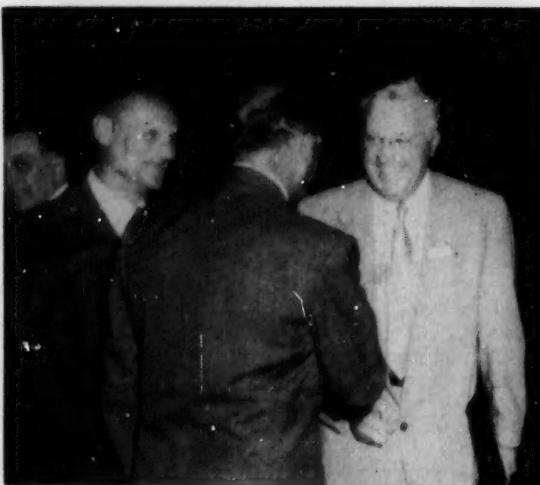
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PLEASANTRIES: (Left) P&G's Lange, Blair; Sinnova's Zelmanns, and (right) Sinnova's Blinoff, Esso-Standard's Young.

International Confab: Seedbed of Progress

There's nothing like a fresh viewpoint to spur any man's imagination. That was the sentiment at last fortnight's meeting of the World Congress on Surface Active Agents—a conference that lured 1,100 delegates from 32 countries to the Sorbonne in Paris to exchange ideas on the fast-moving field of synthetic detergents.

For the first time in its 30-year life, the world's detergent industry laid itself open for a systematic review of research work being carried on, tossed around thoughts as to the present and prospective technological application of its growing fund of knowledge.

Outcome of all the discussion ses-

sions probably can't be fully estimated for many months, but it's a good bet, from the type of comment heard resounding through the halls in a score of languages, that many a company—in far corners of the world—will settle down to reconsider its expansion plans, and development projects.

Taking credit for the organization of the conference is the Chambre Syndicale Tramagras—the French trade association of manufacturers of synthetic detergents. Seventeen specific working groups were set up to study topics ranging from purely technical problems to economic and social aspects of the use of detergents. Experts

(two of them Americans) were chosen to preside over each session; a studied attempt was made to include papers that would be of interest to scientists and executives alike.

"Greatest contribution of all," maintains Vova Blinoff (president of American Alcolac Corp. and group leader of the session dealing with the use of detergents in mechanical industries and metallurgy), "was the fact that the conference clearly showed how far behind the chemists in certain countries have fallen in the study and application of detergents."

Others were outstanding for their "amazing developmental work." Blinoff, for example, was particularly impressed by the work of two Cambridge scientists (J. H. Schulman and R. B. Waterhouse) on the "Lubricant properties of Oil/Water Emulsions," states the work therein noted may actually prove to be a revolutionary step in the treatment of metal surfaces by detergents that can provide self-acting lubrication."

A second conference? A committee will evaluate that, though the consensus is that a second meeting in 2-3 years—perhaps in London—would be well worth while.

On the general impact of this—the first—there is no question. "If nothing else ever comes of it," says Thomas Vaughn, vice-president of Colgate-Palmolive and group leader of the production study session, "the conference has brought together leading figures in the field of detergent chemistry—many of them for the first time." From such associations comes real progress."



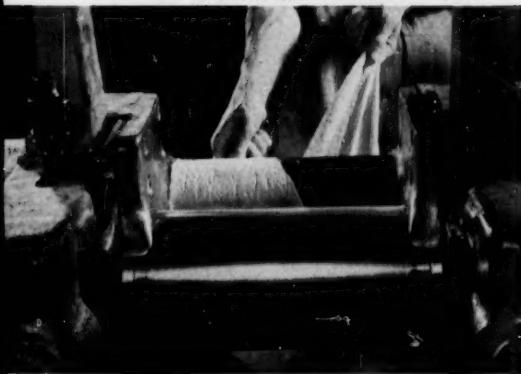
VIEWS: Colgate's Bergeron (left), Vaughn (right), Denauth Federation's Demuth.



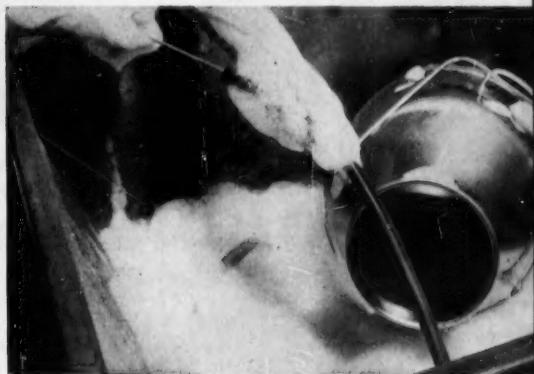
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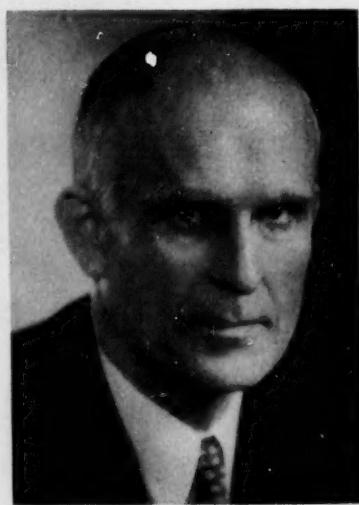
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BUSINESS & INDUSTRY



MERCK'S FROLICH: To U.S. Army's Chemical Corps, an industry viewpoint.

Businesslike Bureau

While others fret over the currently crucial question of how best to manage military research, one federal agency is taking this novel — for Washington — approach: modeling its scientific operations management along the lines of the system used by large chemical companies.

This is the strategy of the U. S. Army's Chemical Corps, whose new leadership is making this key change in organization: a civilian from a leading chemical company is being put into a top management job with the Corps.

Architect for this remodeling is Maj. Gen. William Creasy, recently appointed (*CW Newsletter*, May 1) chief chemical officer. Keystone in his concept of civilian research management is Per Frolich, now a Merck vice-president, who, come December, will take over direct responsibility for the Corps' research and development (*CW Newsletter*, Aug. 28) under Creasy and his deputy, Maj. Gen. Charles Loucks.

Steep Growth Curve: To steel-eyed Bill Creasy, filling this new job will help assure efficiency in an organization with a growth curve outstripping that of almost any large chemical concern. In 1939, the Corps had a budget of \$2.8 million and a total civilian-military employment of 917—but its 1954 fiscal obligations totaled \$118 million and its personnel 12,567.

The Corps is divided into three commands—roughly equivalent to a functional corporation breakdown. One command covers training; the materials command operates six procurement districts, six supply centers,

and two manufacturing arsenals; and the third command — research and engineering — operates the proving ground at Dugway, Utah, the Army Chemical Center at Edgewood, Md., and the biological warfare activities at Camp Detrick, Md.

Frolich's responsibility will cover Detrick, the research and engineering command, and development activities at the manufacturing arsenals near Pine Bluff, Ark., and Denver, Colo.

Idea Conveyor: "In any big organization," Creasy says, "there's bound to be red tape. Because of this, many good, original ideas become fuzzy as they make their way up through channels. A wise management, military or civilian, will find some way to keep the ideas flowing—and also find a way to get new viewpoints on research programs in progress. Two ways that Frolich will help us will be in bucking ideas through the red tape and in having a different, yet technically competent, viewpoint with which to evaluate our work."

Officially, Frolich will have two titles, that of deputy chief chemical officer for scientific activities and Corps' chief scientist. Both are new.

As now established, the management team of Creasy and Loucks works something like a president and exec.-v.p. "If I'm gone for a month-long inspection trip," Creasy asserts, "I can get back and find the office operating along the lines it was when I left." Frolich, next in line, with responsibility for all research and development up through testing of new weapon prototypes, will probably function like Creasy, in not having to supervise myriad details (the Corps' research and development division will do this). Instead, he will be able to devote his time to the scientific problems brought to him, and to those he encounters in his installation tours.

The House Government Operations (Riehman) subcommittee, in its report on military research and development (*CW*, July 7), found that "there are characteristics inherent in military organization that make it difficult to administer an effective program of scientific research and development."

"The issue . . . must be resolved, at least for the present, by continuing to direct and operate these programs within the military establishment with a much greater degree of participation and control by civilian scientists."

Creasy feels that the Chemical Corps' new setup, with its civilian delegation of authority and responsibility for technical direction, can weld a bulletproof patch over this managerial chink in the military armor.

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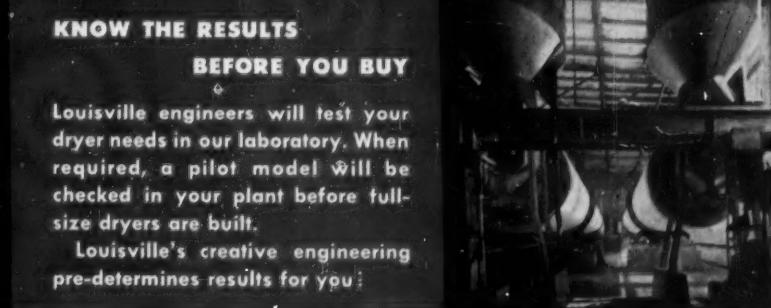
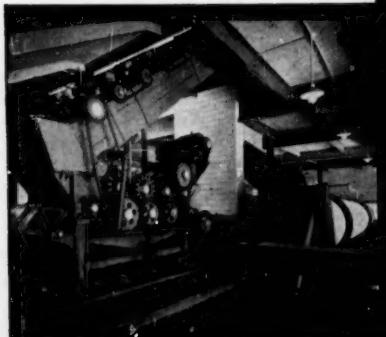
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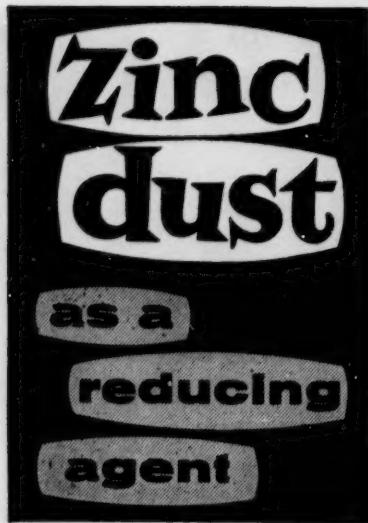
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BUSINESS & INDUSTRY



FBI'S HOOVER: For chemical plant unions, his data may mean no contract.

LABOR

Hurdle for Unions: In its accelerated campaign to "utterly destroy" the Communist Party in the U.S., the Dept. of Justice will be paying particular attention to left-wing labor unions, some of which have a few locals in chemical plants. Attorney General Herbert Brownell says that if a union is found to be Communist dominated, an employer will have no alternative but to withdraw its recognition of that union, even if this leads to a strike.

Here's how a Red-infiltrated union might trip over this hurdle set up by the new Communist control law: anyone—including employers and employees—could complain to the nearest U.S. attorney about a given union. The Dept. of Justice could have the Federal Bureau of Investigation conduct an investigation, after which FBI Chief J. Edgar Hoover could present his findings to the government's Subversive Activities Control Board. That board's criteria would be:

- Does the union have officers "who are, or who within three years have been actively engaged in, knowingly giving support to a Communist organization or the world Communist movement?"

- Has the union itself been aiding or supporting the Communist movement, or has it acted to impair the nation's military strength or its industrial capacity to supply necessary military materials?

If the board declares a union to be under the Red thumb, that union loses its bargaining rights, its right to collect dues, and its right to the services of the National Labor Relations Board.

But all this may not happen too abruptly; a union could go to court, obtain an order postponing any action under the board's finding, and then seek to have that finding nullified either by attacking the evidence presented or by attacking the Constitutionality of the new law. Thus it might take as much as four years or more to get a precedent on such cases.

Strikes, Old and New: Three strikes settled, one averted, others stretching out into weeks and months—that's the seamy side of chemical labor relations this week.

- A general 5¢/hour wage increase, an additional paid holiday, and freezing the 15¢/hour cost-of-living allowance into base wage rates have brought an end to the three-week strike by some 125 members of Local 420, United Gas, Coke & Chemical Workers (CIO), at Monsanto's Mound Laboratory in Dayton.

- Other settlements involved the International Union of Mine, Mill & Smelter Workers. About 250 Mine-Mill members accepted a 5¢ across-the-board wage increase in a two-year contract that halted a four-month strike against the Tennessee Products & Chemical Corp. plant at Wrigley, Tenn.; Mine-Mill members returned to their jobs in the big Phelps-Dodge copper refinery at El Paso, Tex., after a one-week walkout; and the union's Local 598 has accepted the recommendations of a conciliation board for a 2½¢/hour pay rise now and another 3¢ six months later for approximately 16,600 employees of International Nickel Co. at Sudbury and Port Colbourne, Ont.

- A sudden strike by Local 354, International Chemical Workers Union (AFL), has closed the Cabot Carbon Co. plant in Gainesville, Fla.

- Continuing to put in only three-day work weeks as a modified form of striking, members of Local 450, AFL Operating Engineers, have stopped or delayed progress on several large petrochemical projects near Port Arthur, Tex.

- Two Southern paper mill strikes are in the news. At Covington, Va., both company and union officials have rapped the "wildcat" strike undertaken by some 160 members of the United Paper Workers (CIO) employed by the West Virginia Pulp & Paper Co. At Elizabeth, La., where two AFL pulp and paper unions have maintained picket lines for a full two years at plants of Calcasieu Paper and Southern Industries, workers are to be polled by the National Labor Relations board to see whether they want to be represented by those two unions.

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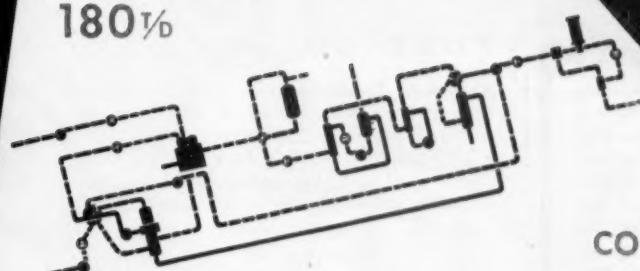
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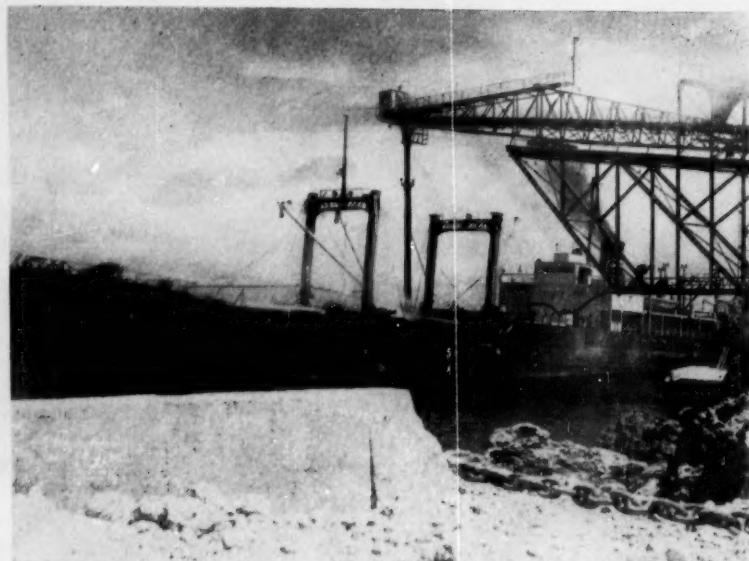
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BUSINESS & INDUSTRY



HEAVY MINING: At Angaur Island, Japanese ships load phosphate for export.

FOREIGN

Phosphate/Pacific Islands: With very little fanfare development of mineral resources in the Trust Territory of the Pacific Islands is moving along steadily climbing to its former important stature. On Angaur Island, for example (which has the largest deposits of rock phosphate) Japanese are busily expanding the mines formerly run by the Germans; mines are currently being worked on several islands in the Marianas, the Palau, the Western Carolines, and at Ebon Island in the Marshalls.

Coke/India: A new battery of coke ovens, built by the German firm, Carl Still, went into operation last week at the Sindri Fertilizer plant in Bihar, East India. The new coking plant cost \$5.5 million; output is estimated at 200,000 tons of coke per year. By-products, will eventually include coal tar, ammonia, benzol, toluene and xylene. As yet recovery units are not completed.

Glass Fiber/Japan: The Asahi Glass Co. and Owens-Corning Fiberglas Corp. have drawn up a contract to establish a glass fiber company in Japan. Application for approval of the contract has already been submitted to the Japanese government. Under terms of the deal, the new firm is expected to be called the Asahi Fibre Glass Co., will be capitalized at \$2.8 million—60% of which will be supplied by Asahi Glass, partly in the form of materials, and 40% by Owens-Corning partly in the form of technical

assistance. Monthly capacity: 35 tons.

Sulfuric Acid/India: Dharamsi Morarji Chemical Co., Bombay, has received governmental permission to build a sulfuric acid plant with a daily capacity of 25-30 tons. Most of the equipment will be imported. Major customer: Burmah-Shell—currently building India's largest oil refinery—which estimates acid use at 9,000 tons/year.

Dyestuffs/India: India will boast a second dyestuff plant within the next two years as a result of an agreement, completed last week, between the Ahmedabad (West India) firm of Ghias and Farbenfabriken Bayer, Germany. Authorized capital for the project is \$4.2 million—but the initial outlay is not expected to amount to more than \$315,000—one third of which will be contributed by Bayer.

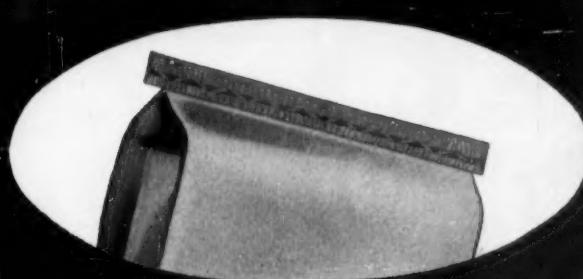
The Ghia-Bayer combine is attracting worldwide attention because, during the past two years, West Germany has been the major supplier of textile dyes to India. Competitors are now openly speculating as to where German dye manufacturers will turn to replace the sales that the Indian enterprise will expropriate.

Sulfuric Acid/Great Britain: Latest addition to Shell's Stanlow oil refinery in Cheshire, England—a sulfuric acid plant to turn out 33,000 tons/year of sulfuric acid—is now in operation. All the acid produced (at least for the present) will be used in the refinery for treating lubricating and white oils, and for producing detergents and petroleum-base chemical derivatives.



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B & I.



CIL-54'S SMITH: After court-ordered split, first dividends hold to schedule.

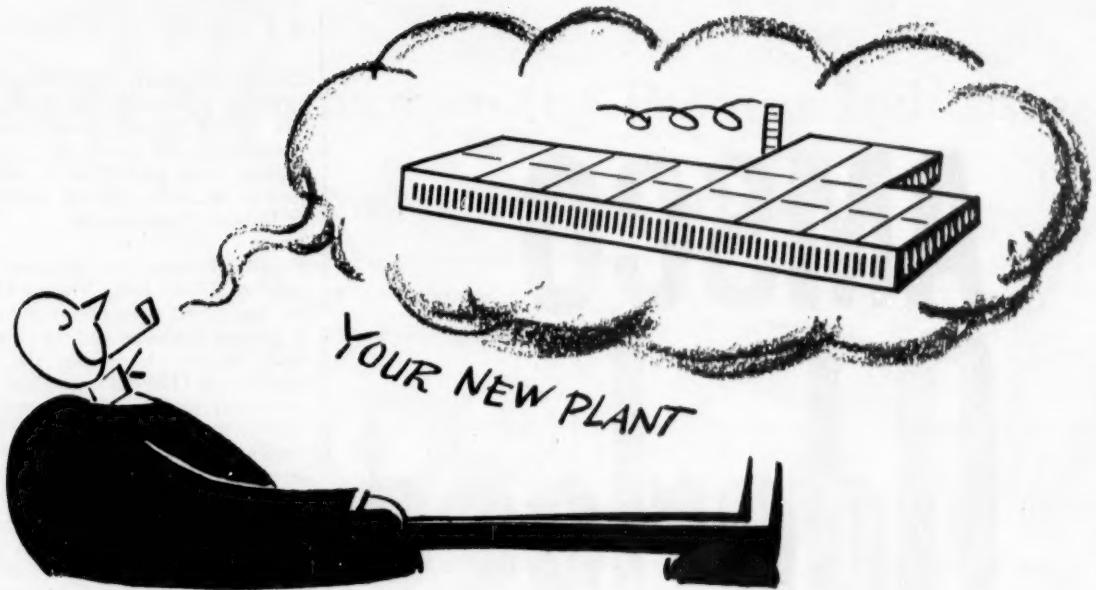
LEGAL.

Dividends Coming: So far, at least, the antitrust decree that cut Canadian Industries Ltd. into two separate companies doesn't seem to have hurt stockholders. CIL-54 President Greville Smith has announced that initial dividend checks, to be mailed to shareholders next month, will be up to expectations. The quarterly dividend on 7½% par \$50 preferred stock will be 93¾¢/share; and payments on common stock will be at the rate of 10¢/share. If shareholders receive equal dividends from the new Du Pont Co. of Canada, their combined common stock dividends will be equal to the 20¢ dividends paid by the old CIL concern for each of the first three quarters last year.

Another antitrust decree affecting Du Pont is anticipated soon in the government's suit at Chicago, in which General Motors and U. S. Rubber are codefendants.

Sulfuric Acid Suit: Du Pont is the plaintiff in a new suit pending in U. S. District Court, Wilmington. The company is suing the Pennsylvania Railroad for \$1,493 on grounds that timbers used in repair of a railroad bridge across the Christina River near Newport, Del., caused the sinking of a barge containing 80,000 gal. of sulfuric acid (in carboys).

Lipstick Litigation: Latest court clash in New York in the cosmetics field is between Hazel Bishop, Inc., and Gillette Safety Razor Co. over lipstick formulation and merchandising. The



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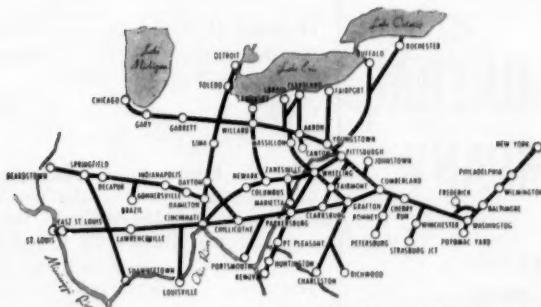
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B & I

Bishop firm asserts that Gillette's Toni division, in launching its Viv lipstick, has copied Bishop lipstick's formula, container, and marketing system. Bishop seeks \$3 million in damages and an injunction against further use of Bishop's "trade secrets."

Plastics Process: In common pleas court at Toledo, Judge Thomas O'Connor has issued a temporary injunction to prevent disclosure and use of certain trade secrets claimed by the Glass Reinforced Plastic Corp. That company charges that a former employee was about to set up for another firm a machine based on knowledge developed by and for GRP.

Ability to Pay: Should a company's profits be a factor in pollution cases? Snively Groves, Inc., a citrus canning firm at Winter Haven, Fla., is attacking a court order that refers to the company's "attractive income" and which states that the company should invest "a great deal more money" in combating pollution. The company contends that the only issue in the case is the alleged odor complained of, asks that the court consider certain pollution control research being sponsored by the firm.

KEY CHANGES . . .

John F. Kirk, to vice-president and director of sales, Velsicol Corp., Chicago.

Arthur I. Mendolia, to assistant director of research, Electrochemicals Dept., Du Pont Co., Wilmington.

Jesse A. Weatherford, to manager, Industrial Sales Dept., West Norfolk, Va.

A. T. Kearney, to chairman of the board, Zonolite Co., Chicago.

Herschel H. Cudd, to vice-president, research and development, American Viscose Corp., Philadelphia.

Hugh S. Ferguson, to director, W. R. Grace & Co., New York, N.Y.

John W. Hanes, to chairman of the finance committee and vice-president for finance, F. Stillman Alfred, John C. Leppart, and Stanley de J. Osborne, to executive vice-presidents, Olin Mathieson Chemical Corp., Baltimore.

W. Yost Fulton, to director, Catalin Corp. of America, New York, N.Y.

Walter C. Thilking, and **Alfred W. Long** to assistant comptrollers, Monsanto Chemical Co., St. Louis.

Harold A. Kornell, to director, Sun Chemical Corp., Long Island City.

Alcoa Aluminum in the Process Industries

Its Applications and Advantages

- for processing equipment
- for chemical and material storage
- for transporting liquids

● Alcoa Aluminum products are backed by 66 years of manufacturing experience, combined with continuous research and development in all branches of the aluminum industry.

The economic and technical advantages of Alcoa Aluminum, the wide

range of properties found in its alloys, and the large variety of shapes and forms in which it is available, make it adaptable for many applications in the process industries.

Available as plate and sheet, structural shapes, extrusions, moldings,

wire, rod, bar, tubing of all types and shapes, foil, forgings, castings of all kinds, rivets and nails, caps and seals, screw machine products, collapsible tubes and special items, Alcoa Aluminum's versatility is proved, as shown by this table.

Where Alcoa Aluminum is Used

PROCESS INDUSTRY APPLICATIONS

Brewery	Yeast equipment, wort coolers, brew kettles, storage tanks, fermenters, filters, coils, coolers, pasteurizing equipment, beer barrels, carbonating tanks.	Textiles Rayon	Hoods, ducts, desulphurizing tanks, piping, extractors, pallets, conveyors, precipitators.
Dairy	Pasteurizers, heat exchangers, milking machines, storage tanks, truck tanks, piping, valves, cheese vats.	Wool, silk	Bleaching equipment, dyeing equipment.
Foods	Kettles, conveyors, truck tanks, stock pots, pans, piping, packaging, refrigeration equipment, cookers, storage tanks, drying trays, evaporators, cooling coils, chutes, screens.	Nylon	Storage tanks, tank cars.
Microbiological	Fermenting tanks, solution tanks, piping.	Ammonium nitrate	Ammonia tanks, evaporators, crystallizers, tank cars, piping, drums, storage tanks.
Petroleum	Condensers, storage tanks, heat exchangers, instrument tubing, piping, bubble caps, towers, tower sheeting, trays, truck tanks, flame arrestors, paint.	Cellulose acetate	Tanks, acetylators, precipitators, washing equipment, driers, dephlegmators, stills, condensers, evaporators, piping.
Refrigeration	Compressors, heat exchangers, evaporators, receivers, tubing, cooling pans, valves, brine tanks, lockers, trays, shelves, grilles, insulation.	Formaldehyde	Receivers, storage tanks, tank cars, piping.
Resins, synthetic	Storage tanks, stills, condensers, receivers, piping, heating coils, weighing tanks, reaction vessels.	Nitroglycerin, gun cotton, dynamite	Hoods, ducts, packaging, filters, storage tanks, wash tanks, extractors.
Rubber	Latex cups, hand carts, storage tanks, acid mixers, coagulation vats, bulkier tanks, vulcanization molds, curing equipment, pans, trays.	Ammonium hydroxide	Condensers, dephlegmators, piping.
		Hydrogen peroxide	Stills, storage tanks, piping, drums, tank cars, pumps, heat exchangers.
		Nitric acid, fuming	Storage tanks, drums, piping, ducts, hoods, heat exchangers.
		Oxygen, tonnage	Heat exchangers, towers, piping.
		Soda ash	Piping, absorbers, stills, heat exchangers.
		Sulphur	Piping, pumps, tanks, recovery and purification equipment.

ALCOA ALUMINUM IN THE PROCESS INDUSTRIES

PROCESS INDUSTRY APPLICATIONS

Lower aliphatic acids	Condensers, receivers, storage tanks, tank cars, piping, oxidizing kettles, crystallizers, filters, melting vessels, pumps.	Paints, varnishes, naval stores	Stills, condensers, storage tanks, piping, drums, tank cars, kettles, filters, solidification trays, screens, centrifuges, heating coils, heat exchangers, emulsifiers, extractors.
Alcohols	Drums, tanks, piping.	Essential oils	Flasks, containers, drums.
Edible oils and fats	Deodorizers, condensers, tanks, piping.	Glycerine	Stills, heat exchangers, receivers, storage tanks, tank cars.
Glue and edible gelatin	Evaporators, tanks, piping, cookers, drying trays, chutes.	Acrylonitrile	Storage tanks, heat exchangers, distillation towers, reactors.
Aldehydes	Drums, storage tanks, tank cars.	Water, distilled or deionized	Storage tanks, piping, condensers, receivers, valves, fittings, degasifiers.
Fatty acids	Condensers, storage tanks, filters, melting tanks, trays, piping.		

Why Alcoa Aluminum is Used...Advantages

HIGH RESISTANCE TO CORROSION • The high resistance of Alcoa Aluminum to attack by water, foods, and many chemicals has led to the use of this metal in processing equipment of many kinds.

LIGHT WEIGHT • Alcoa Aluminum drums and barrels, tank cars and trucks, have the advantage of light weight, easier handling, and more pay load.

HIGH ELECTRICAL CONDUCTIVITY • Alcoa Aluminum Conductors, section for section, have a conductivity 61 per cent of that of copper. Pound for pound, aluminum has a conductivity 201 per cent of that of copper.

HIGH THERMAL CONDUCTIVITY • Aluminum has a thermal conductivity of 0.50 cgs units at 20°C, equivalent to 1,450 Btu per hour per square foot per inch of thickness per degree Fahrenheit. This high thermal conductivity is an advantage in the use of aluminum in equipment where efficient heat transfer is important.

HIGH REFLECTIVITY • Alcoa Aluminum has high reflectivity for both light and radiant heat. Lighting reflectors, finished by the patented Alzak® process, have reflectivities as high as 85 per cent, resist tarnishing, and are easily maintained. Aluminum foil makes an efficient, lightweight insulating medium. Aluminum paint, made with Alcoa Pigments, gives surfaces with a reflectivity of about 70 per cent.

NONMAGNETIC • Aluminum's nonmagnetic characteristic is advantageous for reducing power losses where aluminum is used for shielding electrical conductors and equipment.

GOOD WORKABILITY • Manufacturers find aluminum easy to machine, shape, form, cast, roll, extrude and forge, and assemble with standard tools and machinery. Further, it can be joined by all the known methods of welding. Certain alloys can be brazed.

NONTOXIC • Aluminum is nontoxic to living organisms. Aluminum

equipment has found widespread use, therefore, in the processing of foods and drugs.

STRENGTH IN ALLOYS • By combinations of alloying and heat treating, Alcoa Aluminum is available in a series of alloys having a wide range of mechanical properties. Aluminum sheet is about eight times stiffer than steel sheet of the same weight.

NONSPARKING • Because of its nonsparking characteristic, Alcoa Aluminum provides increased safety wherever explosives or inflammable materials are employed as in powder plant machinery, tools, process equipment and storage facilities.

APPEARANCE • Aluminum has a pleasing modern appearance which makes it attractive as well as functional. In addition to enhancing aluminum's appearance, special finishes may give protection or durable reflectivity. Aluminum paint gives interiors a light, cheerful appearance.

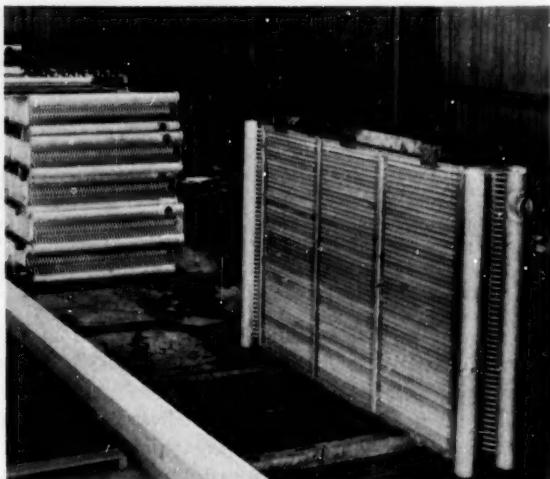
ALCOA ALUMINUM IN THE PROCESS INDUSTRIES.

Heat Exchanger Tubes

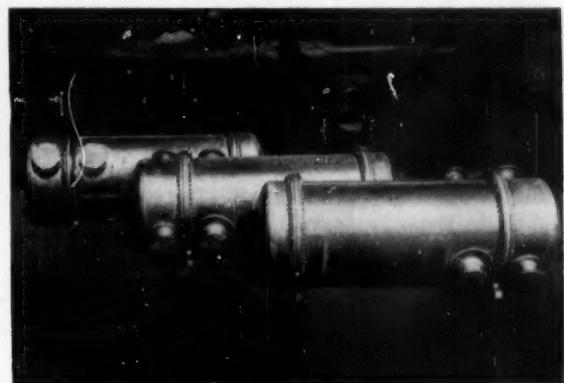
For more than 30 years, Alcoa Aluminum Tubes have been used successfully in condensers and heat exchangers. The natural resistance of aluminum to oxidation and its resistance to corrosion by water, hydrogen sulfide, ammonia, carbon dioxide and a great number of inorganic and organic compounds make it an ideal material for heat exchanger tubes. Alclad tubes are normally recommended where water is the coolant. Because aluminum

alloys may be used with many chemicals without causing discoloration or harmful contamination, they are often used with products where water whiteness is required. High heat conductivity, light weight, and ease of fabrication are among other advantages of aluminum heat exchanger tubes.

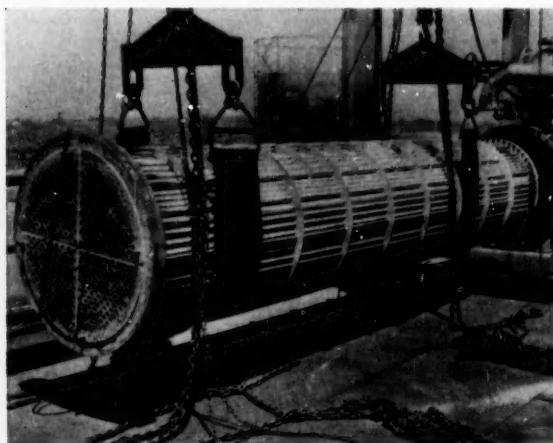
COST • Alcoa Aluminum Heat Exchanger Tubes cost $\frac{1}{3}$ less than mild steel, $\frac{1}{2}$ as much as Admiralty, $\frac{1}{6}$ as much as Stainless. Welded alclad (both sides) tubes are also available, costing 20 per cent less than seamless tubes.



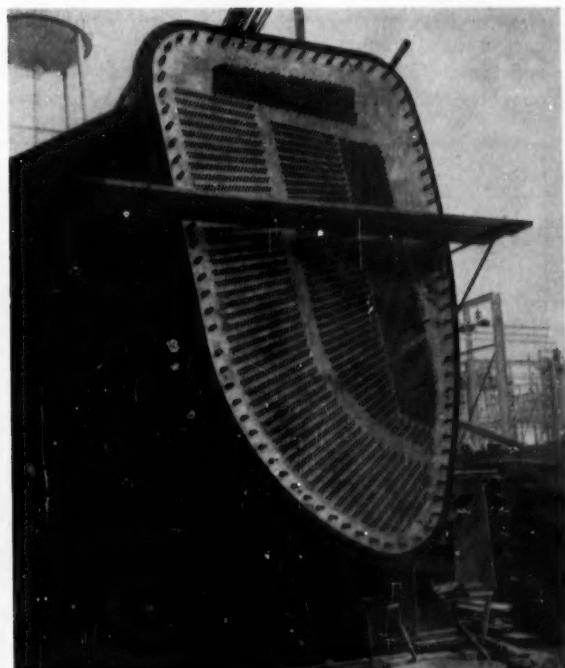
A group of all-aluminum water-cooled finned tube exchangers for conditioning air used in a large wind tunnel. The finned tubes used in these exchangers were constructed by brazing helically wound sheet to the tubes.



All-aluminum exchangers for cooling corrosive ammoniacal process liquors in the soda ash industry. Similar units have been in use for over 15 years in the same plant.



An all-aluminum alloy tube bundle from a T.C.C. overhead condenser after 18 months of continuous service. This aluminum bundle replaced a bundle of another metal which had failed in 18 months. Exposure was to hydrogen sulfide, ammonia, carbon dioxide and hydrocarbons. Virtually no shell side fouling occurred during this period. Coolant was brackish water.

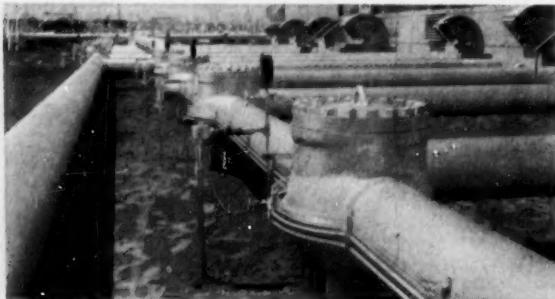


A view taken during the installation of a 70,000 sq ft aluminum tubed surface condenser in a steam power plant.

ALCOA ALUMINUM IN THE PROCESS INDUSTRIES

Utilitube® (Aluminum Coiled Tube)

Alcoa Utilitube is aluminum coiled tube made of an alloy (5050) especially selected to provide low cost, easy workability and high fatigue strength. It is used for instrument air lines, steam tracer lines, hydraulic lines, lubricating lines and refrigeration tubing. Aluminum



Alcoa Utilitube for instruments in a large crude oil station.

tube has about $\frac{1}{3}$ the weight of copper tube, is available in economical long lengths up to 1,000 feet or more, will not form sludge or gum, will not discolor the fluid it carries. It has excellent resistance to corrosion, good bursting strength, excellent mechanical properties at low temperatures.

COST • Utilitube costs up to 40 per cent less than copper.



Alcoa instrument tubing (Utilitube) on catalytic cracker and gas plant. Partially exposed to hydrogen sulfide and sulphur dioxide fumes, tubing shows no corrosion after more than two years of service.

Unitrace® (Steam-traced Pipe)

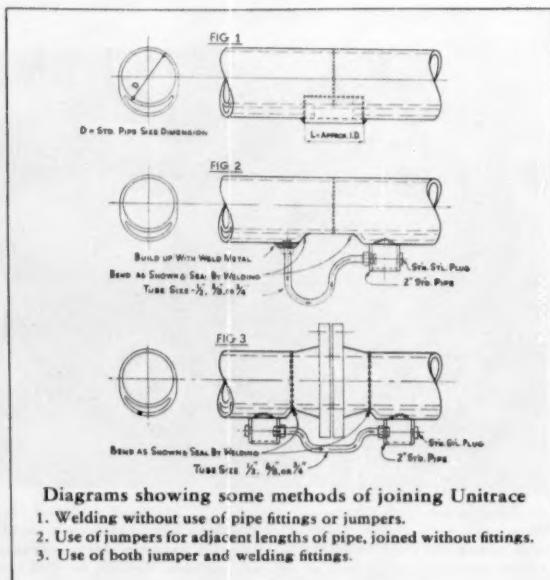
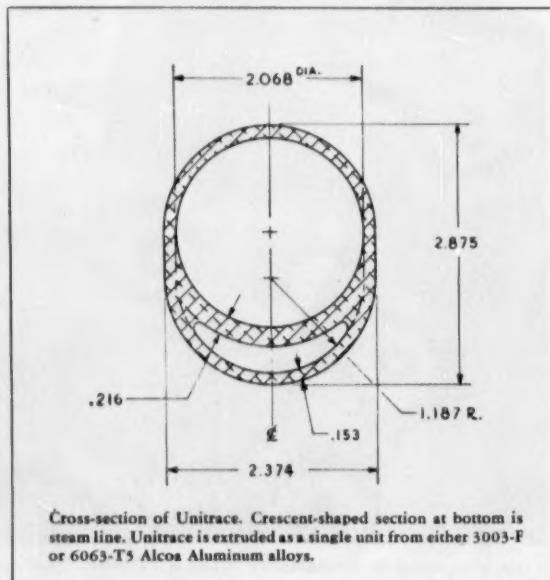
Alcoa's new steam-traced pipe saves 30 per cent of labor costs, reduces material costs, reduces insulation costs over conventional steam jacketed lines.

Unitrace eliminates the cost of external steam jackets or steam tracer tubes because the steam line is an integral part of the aluminum pipe!

Because of the natural corrosion resistance of aluminum, Unitrace is well suited for handling naval stores,

molten sulphur, ammonium nitrate solutions, glacial acetic acid, fatty acids, tar, pitch and similar products normally requiring steam tracing.

Unitrace provides greatly improved heat transfer properties . . . lends itself readily to shop fabrication of standard lengths . . . can be formed easily with pipe bending tools. Preformed insulation will fit Unitrace, but improved efficiency makes thermal insulation unnecessary in many cases. Unitrace is available now in 2 inch pipe size. Larger sizes are being designed.



ALCOA ALUMINUM IN THE PROCESS INDUSTRIES

Pipe and Fittings

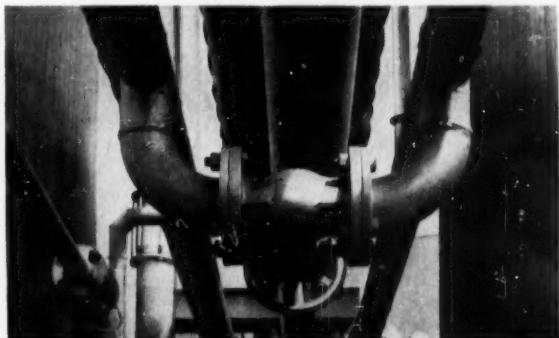
Alcoa Aluminum Pipe and Fittings are used in process piping to carry fluids in chemical, petrochemical and food processing plants. For most applications schedule 40 weight is recommended, in alloy 3003-F, 6061-T6 or 6063-T6. Corrosion resistance is excellent in many environments.



Aluminum process piping systems can be assembled easily by welding. Fittings and flanges are available from a number of suppliers.

ments. Salts are colorless and nontoxic. Aluminum does not catalyze the decomposition of many sensitive chemicals. Its clean, modern look makes it desirable for food processing plants.

COST • Least expensive for applications where corrosion resistance or product protection is important.



Aluminum pipe is used at this organic chemicals plant to handle chemicals for synthetic fibers. The aluminum does not discolor the products.

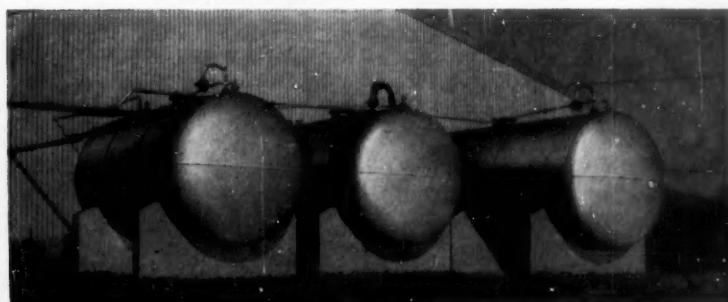
Standard Storage Tanks

Alcoa Standard Storage Tanks in 3003 alloy are available

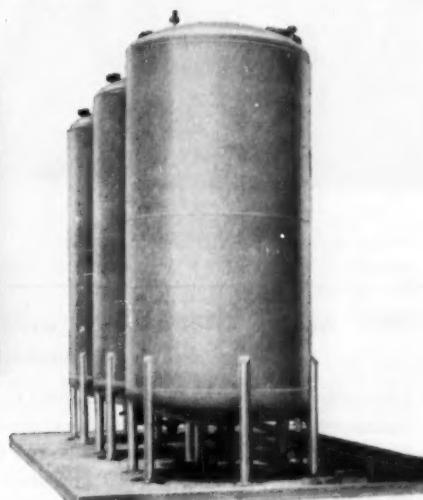
in sizes ranging from 5,800 gallons to 21,400 gallons. Readily available from stocked components, Alcoa Standard Tanks offer low cost and quick delivery.

CHEMICALS STORED AT ATMOSPHERIC PRESSURE IN ALCOA TANKS:

Acetaldehyde	Ammonium thioglycolate	Ethylene glycol	Nitric acid (above 82% conc.)	Solvents
Acetic acid, glacial	Amyl mercaptan	Fatty acids	Nylon salts	Stearic acid
Acetic anhydride	Animal oils	Gasoline	Oleic acid	Sugar solutions
Acetone	Benzene	Glycerine (natural and synthetic)	Phenol	Toluene
Acrylic acid, glacial	Butyl alcohols	Glycerol phosphate	Propyl alcohols	Trichlorobenzene
Acrylonitrile	Cellulose acetate	Lacquer	Propylene glycol	Turpentine
Adipic acid	Edible oils	Methyl alcohol	Resins	Water (distilled or deionized)
Ammonium carbonate	Ethyl acetate	Naphthenic acids	Rosin	Waxes
Ammonium nitrate solutions	Ethyl alcohol	Naval stores	Sorbitol	



Horizontal tanks come in capacities of 6,400; 11,400 and 16,400 gallons.



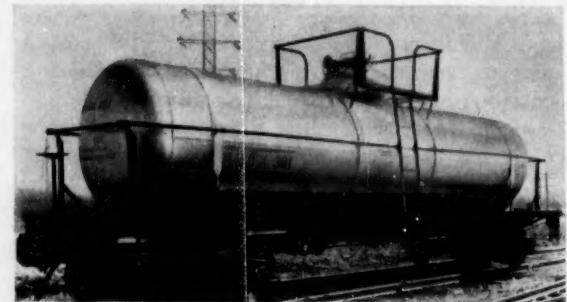
Vertical tanks designed to be supported on a flat base come in capacities of 5,800; 10,800 and 15,800 gallon capacity. Vertical tanks with support come in capacities of 6,400; 11,400 and 16,400 gallons.

ALCOA ALUMINUM IN THE PROCESS INDUSTRIES

Aluminum Tank Cars

(Meet I.C.C. Specifications)

Tank cars made of Alcoa Aluminum offer you real cost-cutting advantages. Aluminum does not contaminate or discolor sensitive liquids—does not promote decomposition. Aluminum is highly resistant to many corrosive ladings—requires far less maintenance than other metals.

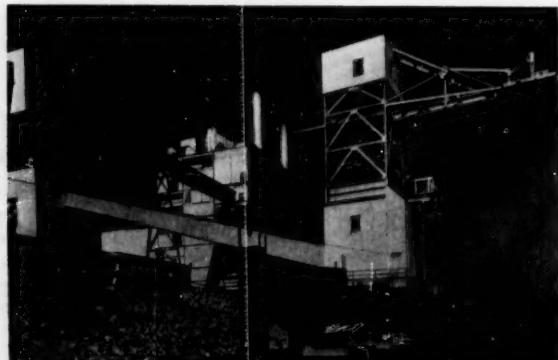
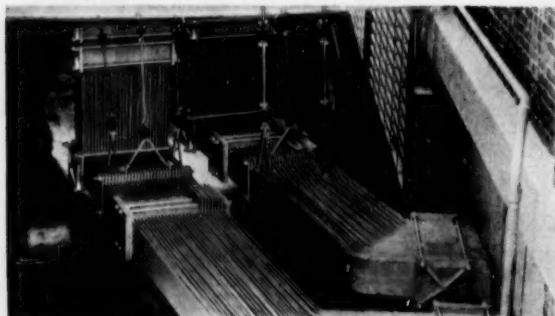


Shipping Containers

Alcoa offers a variety of ICC approved shipping containers ranging in size from 7.5-110 gallons.

Bus Bar

Aluminum's high conductivity coupled with its light weight and high resistance to corrosion makes it an excellent metal for bus bar.



General Metal Work

Alcoa Industrial Building Sheet is used for roofing and siding over coal handling equipment at this power station. Aluminum applications such as roofing, siding, sash, tread plate, gratings, hand rails, trim and conduit are being increasingly used in the process industries to improve plant appearance and reduce maintenance costs.

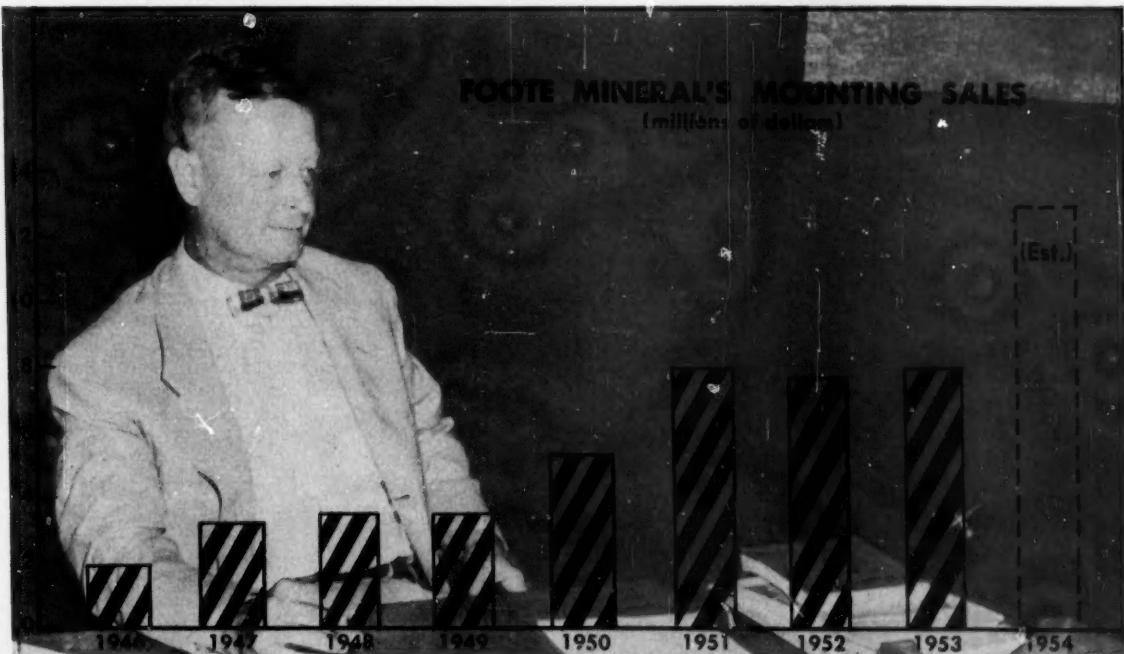
FREE ALCOA LITERATURE—write today for
these helpful Alcoa Booklets.

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- Alcoa Unitrace
- Alcoa Utilitube
- Alcoa Standard Storage Tanks
- Alcoa Pipe and Fittings
- Alcoa Aluminas and Fluorides
- Alcoa Activated[®] Alumina

ALCOA
ALUMINUM

ALUMINUM COMPANY OF AMERICA
906-J Alcoa Building, Pittsburgh 19, Pennsylvania

DISTRIBUTION



FOOTE'S BLISS: For knocking down future market targets, he employs a rifle attack.

Researching Out Sales

"If a salesman is to research future business into our order books . . . he must be relieved of incidental mechanics."

Commercial chemical development has been making news (CW, Sept. 11, p. 91) with increasing frequency lately. As an open sesame to the door leading to expanding sales, "development" is fast becoming a magic word in sales management circles.

This week CW discussed with L. G. "Tony" Bliss, vice-president, sales, Foote Mineral Co., his views on organizing and handling a sales force whose entire emphasis is upon commercial development. What was said:

CW: Just how much has your company expanded since you became associated with it?

Bliss: Saleswise, roughly 500-fold. The year I came, 1933, Foote sales totaled \$165,000. Last year, our business topped \$8 million.

CW: We understand you began to evolve your present sales approach several years ago. When and how did that come about?

Bliss: The basic concept of our sales department originated in 1943. At that time we decided our future lay in the lesser-known minerals and the ele-

ments they contained, provided the minerals were abundant.

CW: How did this idea tie in with your sales approach?

Bliss: In order to develop markets, which at that time were relatively nonexistent, we believed it essential that a sales department be recruited from the ranks of technically educated men who preferably had experience in research or production.

We further believed that each man should specialize in an industry. This way, we would strengthen our opportunities to create substantial markets for some of these lesser-known minerals and elements.

In effect, each man became a researcher without a bench.

CW: It's easy to see how you obtain vertical coverage with such an approach. But wouldn't you need a considerable force to obtain adequate horizontal coverage? We've heard you have an exceptionally small sales force for your volume of business.

Bliss: It's true we have an exceptionally small force for our volume. In



fact, our ratio of sales per man is of the order of \$2 million. In other words, we expect each man to have a capacity of \$2 million per year. In our type of business we do not consider this unreasonable.

CW: Perhaps not. But you must have an unusual setup to permit each man's handling that amount of business. How do you manage it?

Bliss: In the early days of Foote's growth it was necessary to double in brass. This meant that each man, be-

DISTRIBUTION . . .



**"... almost every call
is an act of assistance
to a customer."**

sides specializing in an industry, also had a territorial responsibility. To some extent we minimized the loads by assigning territories that contained the heaviest concentration of the man's own specialty.

CW: And is the setup still the same?

Bliss: To a considerable extent. However, while maintaining the same framework, we relieve our men in several ways. For example, we do most of our horizontal coverage at home.

CW: You mean you don't encourage your men to go out and beat the bushes?

Bliss: Exactly. We follow a strictly rifle approach. Any particular call that a man makes is a result of previous planning. In developing our markets, almost every call is an act of assistance to a potential or active customer.

CW: Then you don't require your men to make a minimum number of calls per day?

Bliss: Hardly. In fact, we hope none of our men ever makes a perfunctory call.

CW: But isn't it just smart practice to cultivate good-will?

Bliss: That's not the point. With the tremendous sales development job still ahead, we spend all our time working out new applications. Even in lithium, farthest along in terms of development maturity of all our products, we've only scratched the surface.

CW: You mentioned you relieve your salesmen in several ways. What did you allude to?

Bliss: I mentioned our home office horizontal coverage. Then there's the sales coordination department.

CW: How does it fit into the picture?

Bliss: Well, inasmuch as we insist that our salesmen concentrate on market development, it makes only good sense to relieve them of the burden of the many mechanics incidental to selling. If a salesman is to research future business into our order books, he obviously must be out in the trade where the needs are most important.

However, we also believe that any customer should be able to get information relative to his interest in our products at any time of day, any day in the week. Therefore, we have backstopped our salesmen with another group, the sales coordination department. Technically qualified and available when wanted, it handles all the mechanics of the sale and is the liaison between the salesmen and the producing units.

CW: From the way you describe your sales department, it sounds more like a product development department. Is this strictly true?

Bliss: I suppose in some companies it might be called that. However, we have two other separate staffs whose functions cover the early-stage and long-range surveys and planning.

One of these, the market survey and product development department, was created two years ago. Its responsibility ceases as soon as the product has been accepted for commercial production, however. H. C. Meyer, Jr., who heads the group, came up through research, production and sales. Furthermore, he has the privilege of using the line salesmen to accumulate much of his information.

CW: And the other service you mention is . . . ?

Bliss: The economic planning section: Although its function is primarily long-range planning, its bearing upon sales can be surmised from the fact that its director, James Fentress, was formerly with the sales group.

CW: To return to your salesmen, isn't it pretty difficult to obtain men who are technically trained and at the same time have good sales potential?

Bliss: Right you are! This problem still faces us. We find, however, that it is easier to convert a technically trained and experienced man to sales than to hire a top-notch salesman and educate him in science.

CW: How did you arrive at that conclusion?

Bliss: We found it difficult to give a man the know-how that usually accompanies a scientific college education. We now require at least a B.S. degree in our sales department; we have several M.S.'s and some Ph. D.'s.

CW: Isn't that contrary to some schools of thought?

Bliss: Yes. But, contrary to concepts in some sales manuals, we earnestly believe that our men are better salesmen because of their technical know-how.

Fundamentally, we are convinced that if a man likes people and is personable, chances are he can develop sales techniques.

CW: What are the backgrounds of some of your men?

Bliss: Largely research. One came out of atomic energy research, one was chief metallurgist at a locomotive works, one a ceramic researcher, one an electrical engineering professor, and several from our own research department.

CW: To get men of that caliber, certainly you must pay them higher salaries than the average for chemical salesmen, don't you?

Bliss: We probably do. However, it isn't a salary in the normal concept of the word. We have a salary plus incentive bonus system.

CW: On what is the incentive based?

Bliss: Simply stated, on two factors. First, on a rating that has been assigned to him based upon his value to the company relative to the other employees. By the way, every employee—not just the sales force—participates.

Second, and this is equally important, the bonus, which is distributed monthly, is based upon a fixed percentage of monthly profits.

CW: And you find this form of incentive really pays off?

Bliss: Definitely yes! Take the case of the sales division managers, for instance. An important part of their remuneration depends upon incentive bonus and profits. The more Foote Mineral grows, the more will their income point upward.

CW: And you believe that the company will continue to expand?

Bliss: We, of course, are quite optimistic. But, confining ourselves strictly to known facts, compare this year's record with 1953. Our reported six-month sales for 1954 was about \$6 million. On that basis, we stand to finish this year with a record-breaking sales total in excess of \$12 million, a 50% step-up over 1953.

And looking into 1955, keep in mind that a substantial increase in lithium production is due to come onstream early next year.

Finally, don't forget we have only begun to open the markets for our other-than-lithium products. They're all yet to grow out of our sales development program.

NEW PATTERNS FOR PROFIT



Will "Magic Pitcher" Ion Exchangers Give Filling Stations Homemade Pure, Distilled-Type Battery Water?

There's a vast potential market for "Magic Pitchers" and ion exchange resins in America's 190,000 service stations . . . and steady profits for manufacturers who distribute to the filling station market.

"Magic Pitchers" can now be made with the assistance of Monsanto customers who produce styrene-type ion exchange resins. These resins purify water just by contact, taking out practically all dissolved mineral hardness.

Want a new product with a steady re-sale for "filler" resins? Investigate the possibilities of a plastic or aluminum pour-out "pitcher" containing styrene ion exchange resins. This could be filled with tap

water . . . would deliver "distilled"-type pure water for batteries. A "strainer" cartridge in the "pitcher" filled with bulk packaged resins would purify a surprising quantity of water. Spent resins could be thrown away . . . replacement cost would be "cheap" through eliminating the time, labor, and expense of buying and handling large bottles of distilled water.

Ion exchange resins are the most practical, inexpensive means of removing small quantities of impurities from liquids.

Investigate this suggested application . . . it is another of the many jobs styrene-type ion exchange resins can do.

Monsanto is a major producer of

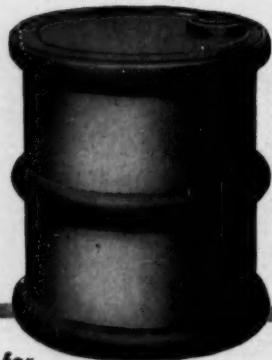
STYRENE MONOMER, the basic resin forming compound, used by customer companies to make styrene ion exchange resins. For application details, write or call **MONSANTO CHEMICAL COMPANY, ROOM 1502, PLASTICS DIVISION, SPRINGFIELD, MASS.**

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CHEMICALS AND PLASTICS
®
SERVING INDUSTRY... WHICH SERVES MANKIND.

ALL RUBBER DRUM

SAFE AND EASY TO HANDLE!

NO METAL
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for

- MURIATIC ACID
- HYDROFLUORIC ACID
- FERRIC CHLORIDE
- CORROSIVE LIQUIDS

★

ICC-43A SPEC.
Tare Weight—34 lbs.
13 gallon capacity

★

Made with
Natural, Neoprene,
Butyl or other Synthetic
Rubber Linings

★

Threaded or Stopper type closures

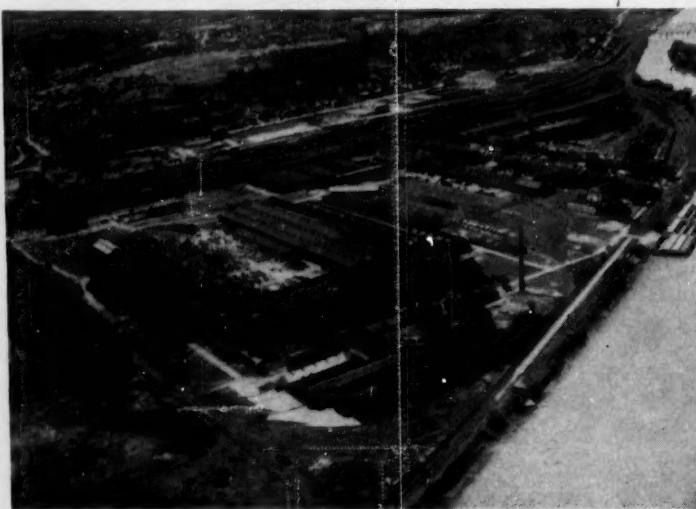


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Terminal at the "Triangle"

CHEMICAL COMPANIES shipping through Pittsburgh can now take advantage of spanking-new terminal facilities only a few miles from the "Golden Triangle" junction of the Ohio, Monongahela, and Allegheny Rivers. Recently opened by the Union Barge Line and McKees Rocks Industrial Enterprises, the center (*shown above*) integrates rail, truck and water transport. Covering over 100 acres of ground, the new terminal provides:

• About 1.8 million sq. ft. of covered storage space plus 30 acres of open storage area equipped with railroad siding and cranes. Office space totaling 40,000 sq. ft. com-

pletes the sales-warehouse distribution facilities.

• A complete terminal railroad with 13.5 miles of track, half mile of river frontage, extensive trailer-truck parking lots, and machinery capable of loading or unloading barges with maximum 60-ton lifts.

Though it's one of the country's largest river ports, Pittsburgh has not had sufficient terminal facilities for general commodities. With the new setup, the area improves its access to over 28,000 miles of inland waterway. Looking over a map of the river network (*below*): Lowell French, president, Union Barge Line; and William Dennis, general manager, McKees Rocks.



D U P O N T A N N O U N C E S :

A New, Simplified Epoxidation Technique

for natural fats, oils and derivatives

Epoxidation in a *single-stage reaction* is a feature of a new hydrogen peroxide-resin technique developed in the Du Pont Laboratories. Hydrogen peroxide is activated by an exchange resin to increase its efficiency in epoxidation. This process simplifies conversion of natural fats and oils into useful derivatives.

IMPORTANT ADVANTAGES OF NEW HYDROGEN PEROXIDE-RESIN TECHNIQUE

- Increases epoxy content
- Lowers by-product formation
- Eliminates preforming peracid
- Minimizes acid requirements

A DETAILED DESCRIPTION of this efficient, simplified epoxidation technique is presented in a new Du Pont technical bulletin. Just fill out and mail the coupon below for this important guide in your development work.

A SUMMARY REPORT on the progress that has been made in the promising new field of epoxidation and hydroxylation is also available in a handy reference booklet. It describes how epoxides are formed; how hydrogen peroxide—manufactured by Du Pont—goes into the preparation of the finished product. The booklet also contains one of the most complete bibliographies available on this interesting subject. Use the coupon below to get your copy.

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BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.) CW-925
Electrochemicals Department, Wilmington 98, Delaware
Please send me the information below.

- Technical Bulletin P 61-454 describing new resin technique for epoxidation.
 Booklet "Epoxidation and Hydroxylation."

Name _____ Position _____

Firm _____

Address _____

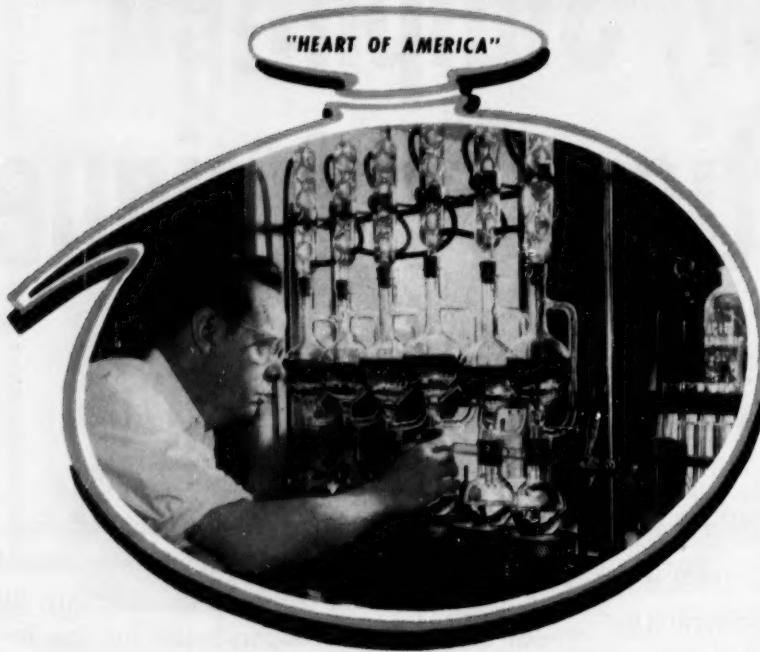
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Millions of dollars worth of chemical products are produced each year in Missouri . . . new "chemical land" of America!

Inorganic and organic chemicals, paints and allied products, drugs and medicines are all major operations and all show remarkable progress in the "show me" state.

Here is a real opportunity for your business . . . and a place for it. Raw materials are readily available. Water, power and fuel for chemical processing are in abundant supply.

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MISSOURI DIVISION OF RESOURCES AND DEVELOPMENT
Dept. I-485

DISTRIBUTION . . .

Marketing on the Dais

White cards pinned to their lapels, chemical marketers eased themselves into chairs in the Hotel New Yorker's North Ballroom last week. Gathered from centers of industry and education across the country, they had come to listen to the week-long meeting of the American Chemical Society's Division of Chemical Marketing and Economics (CW, Sept. 11, p. 91), all a part of the ACS's general meeting in New York.

Possibly reflecting the free-for-all conditions of current markets, this session's agenda was heavily loaded with chemical market development. Papers were presented ranging from the development opportunities for chemical industry in the South Atlantic states to the function of chemical advertising. Here's what some of the listeners heard:

Market development papers were launched with "Costs In Developing Marketing Know-How" delivered by Ralph Ericsson of Sumner Chemical. According to authors Ericsson and Mathieson's L. B. Johnson, there's virtually a complete dearth of literature on the subject. By establishing a hypothetical budget based on standard industry practice, however, Ericsson projected estimated costs of developing marketing know-how and sales for small, medium and large firms.

Respects paid to development costs, one full day was allotted to plastics marketing. Some of the subjects: fluorocarbon marketing; market development of reinforced polyester plastics for the auto industry; irradiated polyethylene, isocyanate polymer, and silicone market establishment. Speakers, including Shaile Bass, Dow Corning, and Louis C. Rubin, M. W. Kellogg Co., stressed the roles of research, engineering, technical service, sales, advertising, and over-all coordination.

Chemical advertising, now at flood-tide vitality for sale, received a full day's spread, too.

If any general conclusion can be drawn from the meetings it's this: men responsible for tomorrow's chemical sales are examining closely the path through market development.

Distributor Appointments: General Tire & Rubber Co. has named the Southern Latex Corp. (Austell, Ga.) sales agents for Gen-Tac latex, a cord dip rubber. The firm will handle sales in Georgia, Florida, Alabama, Mississippi, Tennessee, North and South Carolina.

- Brown-Allen Chemicals, Inc. (Staten Island, N.Y.) has designated



How "Dutch Boy" Chemicals help the plastics industry upgrade quality and reduce costs

Have you heard about the new *double-duty* "Dutch Boy" Plasticizers . . . announced recently?

They make you wonder what National Lead Research will come up with next! Here, for the first time, are factory pre-balanced plasticizers that permit vinyl processors to obtain both low temperature flexibility and low volatility at the same time . . . without sacrificing any other property.

Want outstanding low temperature flexibility with good low volatility? "Dutch Boy" NL F-41 will give it to you. Want to reverse the emphasis? Go to "Dutch Boy" NL F-21. Want 'em in balance? Use "Dutch Boy" NL F-31.

It's as simple as that . . . and for makers of vinyl film, sheeting, extruded products, organosols and plastisols, down goes the cost of producing quality vinyl products. And "Dutch Boy" double-duty Plasticizers, made to the same high standards as "Dutch Boy" Stabilizers, simplify processing, too. No more need to use a half dozen plasticizers to obtain desired properties.

In vinyl plastisols, *Dutch Boy Bentone* gelling agents are helping the formulator control viscosity more precisely.

Should you care to explore the new vinyl formulating opportunities opened up by the "Dutch Boy" Plasticizers, or "Dutch Boy" Stabilizers, or *Dutch Boy Bentone* gelling agents . . .

Or if you would like to know more about other National Lead Chemicals . . . just fill out the coupon. Mail it attached to your letter-head, please.

*Reg. U.S. Pat. Off.



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Please send me the latest information concerning the uses of your new chemicals in the following fields:

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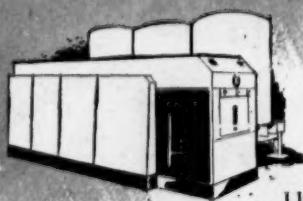
CHEMICALS

*...and get the plus
of a name you know...for quality*

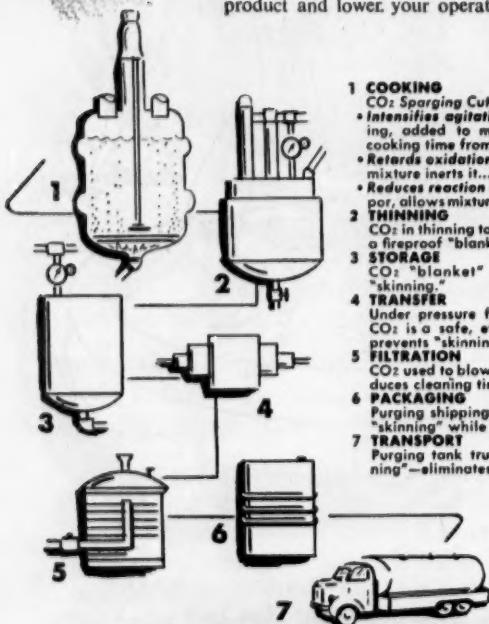
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THE LIQUIFLOW CO₂ SYSTEM. Assures a constant supply of chemically pure CO₂ anywhere in your plant. Let experienced LIQUID engineers show you how an integrated LIQUIFLOW CO₂ System will improve your product and lower your operating costs.



* Diagram above shows results of tests conducted in the Resin Materials Application Research Laboratories of the MONSANTO CHEMICAL COMPANY.

FREE MANUAL "The Uses of CO₂ in Paint, Varnish and Other Alkyd Type Resin Manufacturing" Mail the coupon for your free copy.

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Please send me the new manual, "The Uses of CO₂ in Paint, Varnish and Other Alkyd-Type Resin Manufacturing."

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DISTRIBUTION

George A. Rowley Co., Inc., sales representatives for the Philadelphia area. Brown-Allen manufactures marine and vegetable oils and specialty vehicles.

Sales Offices: National Chemical & Manufacturing Co. (Chicago) has moved and improved its Dallas sales offices.

- Lithium Corporation of America has installed a new sales office in New York City.

Rayon Carpet Standards: "The average householder . . . wants a carpet that will keep its color, wear well, not soil easily, and be relatively inexpensive." This was the purpose in mind behind American Viscose Corp.'s just-inaugurated Quality Code for Rayon Carpets. Under the plan, carpet manufacturers whose products meet specified quality standards in fiber content, pile weight, pile density, backing and bonding material, and color-fastness to light and washing may use AVC's trademark, "Tufton." The standards were formulated from the recommendations of major carpet manufacturers and introduced to the general public at the National Home Furnishings Show in New York last week.

Shot for Plastics Sales: Further stimulus for retail plastics sales came last week from the publication of a "Retailers' Plastics Manual" by the Society of the Plastics Industry and the Manufacturing Chemists' Assn. Patterned to provide retail buyers, sales executives, and consumers with "authoritative information on which to base purchases, sales, and proper use of plastics," the book is a successor to SPI's "How to Buy and Sell Plastics." Information for greater sales, the associations stress, hinges on these factors: the unique properties of the particular plastic; cleaning and general care of each material; knowledge of the advantages and limitations of the specific plastic.

Included in the book are sections on retail sales training programs, selling aids of the industry, a glossary, and a description of basic plastic manufacturing techniques. Copies are available from the Society of the Plastics Industry, New York.

For your reference: Plastics Engineering Handbook—850-p. compilation of technical data covering design, materials, methods, equipment, testing and standards of plastic materials. Reinhold Publishing Corp., New York

- Chlorine Handling—26-p. booklet provides safe handling, shipping, and storage techniques for chlorine. Columbia-Southern Chemical Corp., Pittsburgh.



Dependable Source for
Chemical Raw Materials

From preparing the pulp to de-inking —

WYANDOTTE

serves the Paper Industry

"We look to the chemical industry for three things," states B. H. Cooper, vice president, Kalamazoo Paper Company, Kalamazoo, Michigan. "One, a source of chemical raw materials; two, technical service and advice in handling chemical products; three, new chemical products to enable us to keep pace with progress.

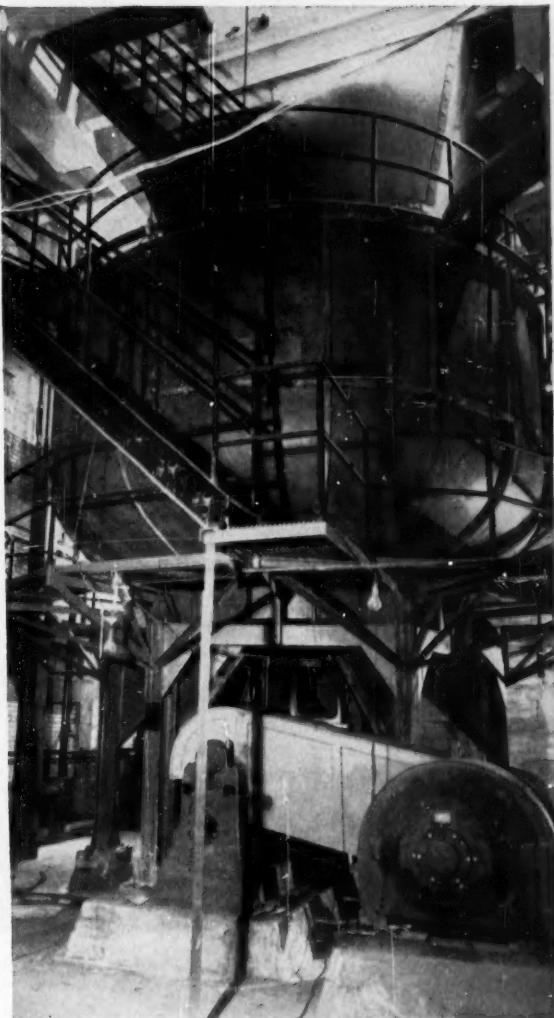
"We do not confine our purchases to any one company. We have carefully selected sources from whom, we believe, we will get the greatest benefits during periods of both long and short supply. Wyandotte is one of our important

sources for caustic and chlorine. Both their quality and services meet our requirements fully.

"Through manufacturers' sales and service representatives, as well as through our own chemists, we are able to keep in touch with the many phases of the chemical industry which can contribute to our business."

How about *your* business — do you use chemical raw materials? Could you use on-the-job assistance in the application or handling of chemical ingredients from time to time? Let Wyandotte work with you in furnishing organic or in-

organic chemicals and helpful technical service, either in the Wyandotte laboratories or in your own plant. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*



An 18' batch cooker-type HR Hydropulper® at Kalamazoo Paper Company, Kalamazoo, Michigan. Caustic soda is used to loosen the bond of the ink to the paper, and form a carrying agent.

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CHEMICALS

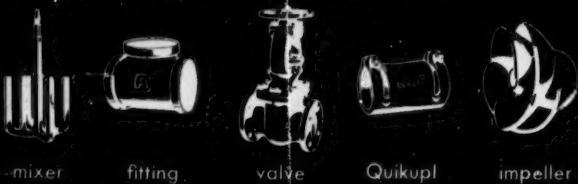
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Soda Ash • Caustic Soda • Bicarbonate of Soda • Chlorine
Calcium Carbonate • Calcium Chloride • Glycols • Synthetic
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You'll sleep like a baby once you've put your corrosion problems in our hands. Whether you want that specially engineered part to be just right—or need top quality cast stainless components in large quantities—or are looking for reliable stainless steel valves, fittings and accessories, specify Cooper Alloy, and stop worrying. One thing is sure—our reputation was built on quality. Use our products with confidence and relax.



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New Chemicals for Industry

Chemical research has borne fruit this year in the form of a record number of new products.

Here they are, an alphabetical roster of chemicals and specialties introduced since Sept. 1953.

Information is, in every case, the manufacturer's. Firms participating in the survey are listed on p. 94.

ACETOACET-m-XYLIDIDE (Acetoacet-2, 4-Xylidide)

(CH₃)₂C₆H₃NHCOCH₂COCH₃. M.W., 205.25; M.P., 89-90°C.; Density, 1.238 gm./ml. at 20°C.; sol. in water, 0.5% at 25°C.; white to light yellow crystalline solid. Chemical properties: Undergoes the numerous condensation and substitution reactions that characterize compounds containing reactive carbonyl and methylene groups. Suggested uses: Intermediate for Hansa Yellow and Benzidine Yellow pigments of improved light stability. Availability: commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

S-ACETYL GLUTATHIONE

C₁₂H₁₉N₃O₇S. M.W., 349.3; M.P., 199-204°C.; spec. rot. [α]_D²⁰—15.8 to —16.5°; easily sol. in hot water, sol. with difficulty in cold water; color, white; crystalline powder; max. absorption at 230 mμ; E = 4.73 × 10⁴. Suggested uses: biochemical and medical research. Schwarz Laboratories, Inc.

ACRYLIC ACID

CH₂=CHCOOH. M.W., 72.03; Sp.G., 1.0379 at 30°C.; B.P. 141°C. (760 mm.); M.P. 13.06°C. miscible with water and many organic solvents. Offered as a 50% aqueous solution. Enters into expected reactions of an activated double bond and carboxylic group. Potential uses include synthetic fibers, warp sizes, textile and paper finishes, thickening agents, and soil modification. Availability: Semi-commercial. American Cyanamid Co.

ACRYLAMIDE

CH₂=CHCONH₂. M.W., 71.08; Sp.G., 1.122 at 30°C.; M.P. 84.5°C.; B.P. 125°C. (25 mm.); white crystalline solid; very soluble in water. Chemical properties: Will undergo the usual reactions of the amide group and of an activated double bond. Polymer and copolymers of acrylamide are of interest as adhesives, dispersants, thickening agents and flocculents. Other uses include such fields as dyes and pigments, paper photographic arts, surface coatings and textiles. Availability: Semi-commercial quantities. American Cyanamid Co.

PENNSALT ACTIDIP

Specially-formulated crystalline activator applied prior to phosphatizing with Fosbonds 10, 40, or 61. Actidip is used as a spray or dip, either alone or compounded with a Pennsalt Activated cleaner. It activates the metal surface in such a way as to promote "flash" crystallization of the piece over the entire surface. This acts to reduce coating time, produce a finer more uniform crystal matrix with complete coverage, and reduce consumption of phosphatizing solu-

tions up to 40%. In addition, the resultant fine-grained zinc phosphate coating has excellent corrosion resistance and is easier to cover with one coat of paint. Commercially available through Metal Processing Department, Pennsylvania Salt Mfg. Co.

ADENOSINE TRIPHOSPHATE, DISODIUM SALT, CRYSTALLINE

C₁₀H₂₀N₅O₁₆P₃Na₂·3H₂O. M.W., 605; sol. in water, almost infinite yielding a heavy, oily solution at very high concentrations, pH of a solution of the disodium salt, approximately 3; color, white; crystal form, microscopic needles. Chemical properties: Used as a coenzyme in many biochemical systems. The three phosphate groups are labile and can be removed either one at a time or all three depending upon conditions. ATP is a raw material for the preparation of Adenosine-5-Phosphoric Acid (Muscle Adenylic Acid). This is the first time ATP has ever been crystallized in any form. Purities have rarely been over 90% in the past whereas this crystalline form is very close to 100% pure. This greatly reduces the possibility of trace contaminants affecting sensitive biochemical systems. Suggested uses: For the preparation of Adenosine Diphosphate and Adenosine-5-Phosphoric Acid; for biochemical and medical research; as a clinical drug in the treatment of bursitis, puritis, etc. Availability: Almost unlimited pharmaceutical quantities. Sigma Chemical Co.

ADIPOL 810 (iso-decyl octyl adipate)

Sp. G. @ 20°C./25°C., 0.924; Mid-Boiling Point @ 4 mm., 227°C.; R.I. @ 25°C., 1.448; Viscosity @ 20°C., 20 cps; light colored oily-liquid. Suggested uses: Primary plasticizer for vinyls and other resins with low volatility and excellent low temperature properties. Availability: Any quantity. Ohio-Apek Div., Food Machinery and Chemical Corp.

AEROCAT TRIPLE A* HIGH ALUMINA CATALYST

A new high alumina (25%) fluid cracking catalyst for the petroleum industry which maintains a 15-25% higher equilibrium activity than 13% alumina catalyst, resulting in more efficient cracking operations. Lower stack losses—this means more effective retention of fresh catalyst additions, and permits the withdrawal of a higher proportion of spent, heavy material from the cracking unit. The result is better fluidization and retention of a higher level of activity. High resistance to attrition is also indicated. Excellent selectivity in a number of base stocks is also indicated by laboratory experience. American Cyanamid Co.

AEROSOL MA 80%, DI HEXYLSODIUM SULFOSUCCINATE

Now available as a solution containing 80% active ingredient. This form is convenient for storage, handling, and mixture mixing. It possesses a powerful penetrating action. Excellent calcium tolerance. Aerosol MA is used chiefly in emulsion polymerization and as a wetting agent in dilute solutions of salts. Commercially available. American Cyanamid Co.

AEROCAT TRIPLE A* HIGH ALUMINA CATALYST

Physical properties: Clear viscous liquid, 78% solids. Excellent wetting, foaming, solubility and emulsion-promoting power. Is well suited to most OT applications, except those in anhydrous systems. Uses: Economical form of AEROSOL OT. Used in dry cleaning preparations, emulsion polymerization, textile specialty manufacture, pharmaceutical manufacture, catalyst manufacture, filtration aids, crystal-growth modification, ceramics, detergent formulations, embalming fluids, antiseptics, preparation of emulsions, cosmetics, photoengraving solutions, blueprint and photographic preparations, emulsion breaking inks, paper manufacture. Commercially available. American Cyanamid Co.

AEROTEX ACCELERATOR MX

A catalyst which may be used with all textile thermosetting resins but is especially effective with melamine-formaldehyde resins. The product is supplied as a clear, colorless liquid dilutable with water in all proportions. It has excellent storage stability over a wide temperature range and is not affected by freezing. When applied to cellulose fabrics with melamine-formaldehyde resins, it greatly reduces the loss in tensile strength and the yellowing during chlorine bleaching. In addition, it produces a marked increase in the efficiency of the resin. Forty per cent by weight of Aerotex Accelerator MX based on the weight of the resin solids is recommended for optimum results. Pad baths prepared with this accelerator are usually slightly alkaline and have exceptional stability. The treated fabrics usually have a neutral or nearly neutral pH. The use of this accelerator will reduce the bleeding of direct dyes. Commercially available. American Cyanamid Co.

AEROTEX ACCELERATOR NF

A white, water soluble, crystalline material. Primarily an accelerator to be used with Pyroset Fire Retardant SF. Two to three per cent of accelerator based on the weight of the resin solids is recommended. Commercially available. American Cyanamid Co.

AEROTEX RESIN 802

A modified urea-formaldehyde resin in liquid

C W Report

form. This product shows excellent storage stability and excellent compatibility with most textile finishing compounds. When applied to various types of nylon fabrics, Aerotex Resin 802 produces a stiff, resilient finish, it may be applied to cotton, rayon or blends of these fibers with other fibers such as acetate to impart shrinkage control, crease resistance and a full, round hand. These properties are desirable to cutting, sewing, pre-treatment, washing, and other operations. When applied to an all-viscose or viscoseblend suiting fabric with Permal Resin, it will provide a full, round, resilient, worsted-like hand. This combination also improves water repellency, spot resistance, shrinkage control and crease resistance. Commercially available. American Cyanamid Co.

AEROTEX RESIN UM SPECIAL

A white, free-flowing, water soluble melamine-formaldehyde resin. This product is compatible with most textile finishing compounds. It is used to produce durable wrinkle resistance and shrinkage control of cellulose fabrics. It is also used for producing glazed chintz and embossed finishes with excellent durability. May be used successfully with THPC, the fire retardant developed by the Southern Regional Research Laboratory. Commercially available. American Cyanamid Co.

AK-WA-KOOL

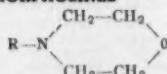
An aqueous coolant, a treated water, contains no oil, grease or wax, is not an emulsion, is non-toxic, has no odor, is non-reactive and non-injurious to metal, cloth, wood or plastic, and is non-injurious to machine operator. A straight treated water coolant which carries off more heat carries heat away faster, allows cuttings and grindings to settle out much faster, will not go rancid even when allowed to lie dormant in equipment for a period of weeks, will not froth or foam, can be used at all pressures and all temperatures, and in all pumping and pressure systems without separation or deterioration; and more important, in addition to being a coolant is an excellent rust inhibitor. It rust inhibits both production and equipment, preventing oxidation on production and equipment for at least three months on inside storage. Ak-Wa-Kool is extremely easy to maintain and keep in perfect control without cumbersome or technical equipment or tests. Useful life at least 300% greater than present day coolants commercially available. A. J. Stull & Co.

ALATHON 10 & 14 POLYETHYLENE RESIN
 $(-\text{CH}_2-\text{CH}_2-)_n$. Waxy, white, translucent solid sold in the form of cubes approximately $\frac{1}{4}$ inch on a side. Properties: freedom from taste, odor, toxicity; flexibility at extremely low temperatures; low moisture-vapor transmission; resistance to chemicals, solvents, greases; lightness of weight; dielectric characteristics; heat-sealability; tear strength. Uses: packaging, tableware, pipe, battery parts. Polychemicals Department, E. I. du Pont de Nemours & Co.

ALKOPHOS CE

1.2 Al_2O_3 , 3 P_2O_5 , $\times \text{H}_2\text{O}$; $\text{Al}_2\text{O}_3 = 10\%$; $\text{P}_2\text{O}_5 = 35\%$; Ignition loss 5%; pH of a 1% solution = 2.4. The product is a light yellow clear liquid. It is used as a binder in high temperature ceramic mixtures. It also improves the green strength. It has a high melting point and gives good bonding properties at low, intermediate, and high temperatures. It is now available in truckload and carload quantities. Monsanto Chemical Co., Inorganic Chemicals Div.

N-ALKYL MORPHOLINES



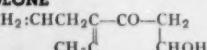
where the "R" is derived from either coco or tallow. Soluble (1 gram morpholine, 1 gram solvent) in acetone, benzene, propylene, tetrachloroethylene, mineral oil, VM&P Naphtha and ethyl acetate. The coco morpholine is somewhat

dispersible in both hot and cold water. Typical analysis:

	N-COCO MORPHO- LINE	N-TALLOW MORPHO- LINE
Primary amine	0.6%	2.8%
Secondary amine	0	0
Tertiary amine	94.0%	95.4%
Apparent		
morpholine	95.4%	98.5%
Color	6 Gardner	10-11 Gardner
Solidification		
point	-12°C.	4.5°C.
Boiling		
point	135-165°C. @ 0.5 mm.	160-200°C. @ 0.3 mm.
Density	Ca. 0.90	Ca. 0.90

Suggested uses: Anti-static agents, corrosion inhibitors, surfactants and flotation reagents. Availability: Pilot plant quantities. Armour Chem. Div.

ALLETHROLONE



A refined grade of the cyclic keto alcohol, 2-allyl-3-methyl-4-hydroxy-2-cyclo-pentenone; M.W., 152.18; Sp. G., 1.0580-1.0590 at 25/25°C.; R.I., 1.5140 to 1.5160 at 20°C.; a yellow to light amber liquid at room temperatures; has a distinct but agreeable odor suggestive of camomile. Availability: Experimental quantities immediately available; larger supplies readily arranged. New York Quinine & Chem. Works.

ALLO-OCIMENE (Tradename "NALENE")

$\text{C}_{10}\text{H}_{16}$, M.W., 136.23; Sp. Gr., 0.824, @ 15.5°/15.5°C.; R.I., 1.5378 @ 20°C.; Boiling range 5%-89°C. 95%-91°C. (@ 20 mm.); Color—Clear, almost colorless. Chemical properties: It is very active chemically, having three double bonds and two degrees of conjugation. It polymerizes easily and cannot be distilled at atmospheric pressure without appreciable polymerization. It is easily oxidized by air. Suggested uses: Production of varnishes, modifier for a wide variety of polymers and copolymers. Availability: Commercial quantities. Newport Industries, Inc.

ALPEX HYDROCARBON RESIN

M.P., 145-155°C.; Clear brownish color; Sp. G., 77°F., 0.975; Pounds per gallon 7.7, 8.12; Acid value, 0-2. Alkydol Laboratories, Inc.

ALPHA, ALPHA'-AZODISOBUTYRONITRILE RECRYSTALLIZED

$(\text{CH}_3)_2\text{C}(\text{CN})-\text{N}=\text{N}-\text{C}(\text{CN})(\text{CH}_3)_2$, M.W., 164.21 M.P., 104°C. Polymerization catalyst for certain polymerizable organic compounds. Blowing agent for plastics. Commercially available. Westvaco Laboratories.

alpha-BROMO-para-NITROACETO-PHENONE

$\text{C}_8\text{H}_7\text{NO}_2\text{COCH}_2\text{Br}$, M.W., 244. Fine, crystalline powder; color, yellow; average purity (as is) 98.0-99.5%, usually 100% on dry basis; 32.2-32.8% bromine content; melting point consistently above 97°C. Uses: Pharmaceutical. Commercially available. Antara Chemicals, a Sales Division of General Aniline & Film Corp.

ALPHA-CHLORALOSE

$\text{C}_9\text{H}_{11}\text{Cl}_2\text{O}_6$, M.W., 309.54. M.P. 187. Slightly soluble in water, soluble in ether. White powder. Uses: the ideal animal anaesthetic, giving anaesthesia without loss of reflex. Available: commercial quantities. Heifetz & Co.

ALPHA OLEFIN 3877-A

Typical Properties: Normal straight chain C_{16} and C_{18} chain length compound. It has one double bond in the alpha position. Typical Analysis: Acid No. = 0; I.V. = 103; Hydroxyl Val. = 0; Titer = $<9^\circ$ C.; Br. No. = >65 ; Flash Point = 265°F.; Boiling Range @ 7.5 MM Hg = 128-158°C. Suggested Uses: Chemical synthesis, resins, plastics, petroleum additives, textile agents, detergents, sulfonates, polymers. Availability: Experimental quantities from Pilot Plant production. Archer-Daniels-Midland Co.

ALUMINUM HYDROXIDE "true" technical

$\text{Al}(\text{OH})_3$, M.W., 77.99. White, odorless powder. Insoluble in water and alcohol, readily soluble in organic and inorganic acids. Chemical properties: Unlike the hydrated alumina heretofore available, this product is not calcined and is very reactive. Suggested uses: In the preparation of other Aluminum salts. Availability: Commercial quantities. Chemo Puro Mfg. Corp.

ALUMINUM HYDROXIDE, WET GEL

Aluminum Hydroxide, WET GEL assays 10.0

to 13.0%. Proper therapeutic efficiency is insured by its high acid-consuming capacity and chemical purity. It is of special interest to the pharmaceutical, food and cosmetic industries. Specifications and other literature available upon request. J. T. Baker Chemical Co.

ALUMINUM NITRATE PURIFIED AND TECHNICAL CRYSTAL

$\text{Al}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$. This chemical is of great value to the electronic, petroleum, textile, leather and other key industries. These grades are offered to meet industry demands for different degrees of purity. Specifications and literature available upon request. J. T. Baker Chemical Co.

meta-AMINO PHENYL METHYL CARBINOL

$\text{NH}_2\text{C}_6\text{H}_4[\text{CH}(\text{OH})\text{CH}_3]$, M.W., 137.18; Fr. P., 66.4°C.; Density, 1.173 gm./ml. at 20°C.; B.P., 217.3°C. (100 mm.); V.P. <0.01 mm. Hg at 20°C.; sol. in water, 36% at 25°C.; white crystalline solid. Chemical properties: Undergoes reactions typical of primary amines and secondary alcohols; usual reactions on benzene ring are possible when the amino and hydroxyl groups are protected by acetylation. Suggested uses: Intermediate for dye-stuffs and pharmaceuticals. Availability: commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

3-AMINOPYRIDINE

$\text{NH}_2\text{C}_6\text{H}_4\text{N}$, M.W., 94.11. Crystals (leaflets); M.P., 64°C.; B.P., 250°C.; sol. water, alcohol, ether; insol. Ligroin. Uses: As a pharmaceutical intermediate. Availability: Experimental quantities. Eastern Chemical Corp.

AMMONIUM GLYCOLATE SOLUTION, 80% Syrup

Yellow, viscous liquid. Grades: technical, C.P. Availability: pilot plant scale. Uses: Plating baths; stabilizing petroleum emulsions. City Chemical Corp.

AMMONIUM PICRATE

$\text{C}_6\text{H}_5\text{NO}_3\text{O}_2\text{NH}_4$, M.W., 246.14. Yellow-orange crystals. Explosive! Slightly soluble in cold water, more in hot. Slightly soluble in alcohol. Grade: pure. Uses: explosives, fireworks. Availability: Laboratory scale. City Chemical Corp.

AMYL ACETATE 280

A special amyl acetate for lacquer formulation imparts high blush resistance. Color, water white; Sp. G., 0.87 at 20°/20°C.; I.B.P., 115°C.; F.B.P., 150°C.; Flash Point (open cup), 80°F. Available in commercial quantities from Sharples Chemicals Inc.

PRIMARY AMYL ACETATES

A mixture containing primarily acetates of pentanol-1, 3-methyl butanol-1, and 2-methyl butanol-1, contains no secondary acetates. Sp. G., 0.8714 at 25°/20°C.; distillation range, 140-149°C. (760 mm.); rel. evap. rate (n-butyl acetate=100), 53; toluene dil. ratio, 2.2; naphthalene dil. ratio, 1.4; blush resistance, 91% rel. hum. at 80°F.; odor, fruity; color, water white. Suggested uses: As a moderate boiling solvent for nitrocellulose lacquers; in the formulation of specialty lacquers for leather finishes, textile sizes, and paper coatings. Availability: development quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

PRIMARY AMYL ALCOHOLS

A mixture containing pentanol-1, 3-methyl butanol-1, and 2-methyl butanol-1; contains no secondary alcohols. Sp. G., 0.8134 at 20°/20°C.; B.P., 133.1 (760 mm.); V.P., 2.8 mm. Hg at 20°C.; Fr.P. sets to glass below -90° C. Visc., 4.3 cps. at 20°C.; sol. in water, 1.7% at 20°C.; sol. water in, 9.2% at 20°C.; rel. evap. rate (n-butyl acetate=100), 26. Chemical properties: Forms esters and undergoes other reactions typical of primary alcohols. Suggested uses: Preparation of ore flotation agents, diesel fuel additives, plasticizers, lacquer solvents, and surface-active agents. Availability: commercial quantities. Carbide and Carbon Chemicals Co., a Division of United Carbide and Carbon Corp.

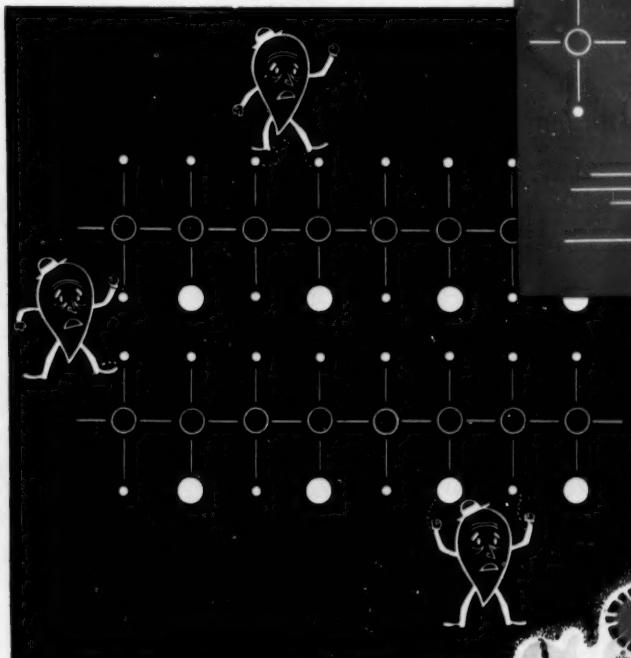
PRIMARY AMYL ALCOHOLS

M.W., 88.15; Color, water white; Sp. G., 0.81-0.82 at 20°/20°C.; I.B.P., 127.5°C.; F.B.P., 140°C.; Flash Point (open cup), 100-125°F.; Primary Amyl Alcohol Content, 95%. Suggested as an intermediate for plasticizers, fuel additives, esters, mining chemicals, and synthetic lubricants, and as a selective solvent. Available in commercial quantities. Sharples Chemicals Inc.

AMYLAMINE

$\text{C}_5\text{H}_11\text{NH}_2$, M.W., 87.16; Sp. G., 0.75-0.76

Plasticizers can't migrate...



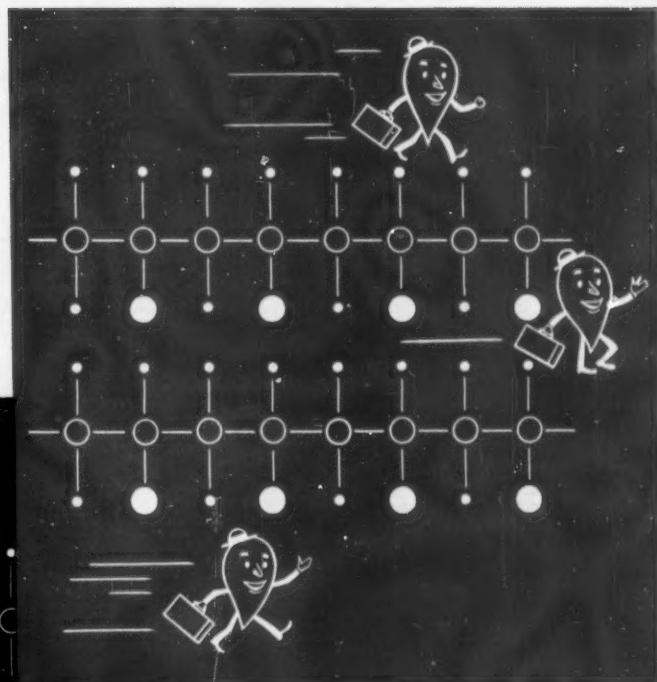
TYPICAL USES

- Heat-seal and solvent-reactivating coatings
 - Adhesives for transparent sheetings, foils, varnished papers, inked papers, and other difficult surfaces
 - Water-resistant and asphaltproof coatings
 - Binders for pigments, paper, fibers, asbestos, etc.
 - Sizes and binders for textiles and carpets
- ... or National will tailor-make a Vinyl Acetate Copolymer for your specific use.

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September 25, 1954 • Chemical Week



We lock 'em in!



Internally plasticized Copolymers of Vinyl Acetate give films that are *permanently flexible*. Plasticizer is locked in by a chemical bond. Can't escape even if heated for days. In addition to permanent flexibility you get—

- Very good adhesion
- Excellent light stability
- Good film clarity and film continuity
- Greaseproofness
- Ease of application
- Compatibility with many other chemicals ... supplied in solution, emulsion or hot melt form.

I'd like to talk to a National representative about Vinyl Acetate Copolymers for _____

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

at 20°/20°C.; color, water white; Amine Content 95%; I.B.P., 90°C.; F.B.P., 110°C.; Flash Point (open cup), 30°F. Suggested applications: intermediate for the production of oil-soluble catalysts, acid acceptors, extractants, corrosion inhibitors, rubber chemicals etc. Available in semi-commercial quantities. Sharples Chemicals Inc.

ANILINE PHOSPHATE (sec.)

($C_6H_5NH_2$)₂HPO₄. M.W., 284.28; White powder. Insoluble in water. Grade: pure. Availability: pilot-plant scale. City Chemical Corp.

ANTIOXIDANT 425*

2, 2'-methylenobis (4-ethyl-6-tertiary-butylphenol). M.W., 368.6; Sp. G., 1.10; M.P., 126.7°C.; insol. in water; sol. in benzene, acetone alcohol; color, white; odor, faint phenolic. Chemical properties, relatively unreactive compound. The phenol groups are sterically hindered. Uses: as a non-staining, non-discoloring oxidation inhibitor for rubber. Commercially available. American Cyanamid Co.

ANTI-STATIC AGENT—ATLAS G-3780

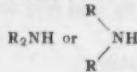
G-3780 is a liquid, nonionic, essentially 100% active material, that is an effective anti-static agent on most fibers. It has a viscosity of about 390 cps. at 25°C. and has a specific gravity of 1.04 at 30°C. It is soluble in water, lower alcohols, acetone, carbon tetrachloride, Perclene, and can be solubilized in most mineral oils with various surfactants. No-irritating and non-corrosive. Recommended for use at about 0.5% solids based on the weight of the goods. Commercially available. Atlas Powder Co.

**ARCCO C 510 SOLUTION LAMINANT
for Vinyl Films**

A solution coating which when applied to fabrics produces a strong heat seal bond to vinyl film. Temperatures of 325°F. to 350°F. required for optimum results. Compound designed for spreader knife application. Produces economies as compared to other methods of lamination. Now used in commercial quantities. Commercially available. American Resinous Chemical Corp.

ARCCO C 602 POLYETHYLENE**Overprint Varnish**

A solution coating designed to deposit tough, flexible and abrasion-resistant film on printed polyethylene surfaces. ARCCO C 602 may be applied by standard aniline printing equipment. Being used in commercial quantities to protect printed polyethylene films. Commercially available. American Resinous Chemical Corp.

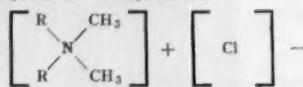
ARMEEN 2S—ARMEEN 2T

(Secondary Fatty Amines.) These are the first secondary fatty amines in which the long alkyl chain is derived from unsaturated fats. The unsaturation in the alkyl chains in both compounds contributes better solubility in organic solvents and makes both products more easily liquefied than the corresponding saturated secondary amine. Average Analyses:

	Armeen 2S	Armeen 2T
Secondary amine content	85%	85%
Primary amine content	5%	5%
Neutralization equivalent	520.540	520.540
Iodine Value	60 min.	30 min.
Temperature to liquefy	45° to 50°C.	50° to 55°C.
Color	Light tan	Light tan

Both products are insoluble in water and completely soluble in most organic solvents above 50°C. Suggested uses: The cation active properties of these chemicals suggest their use in corrosion inhibitors, as lubricant additives, in rubber processing, as intermediates for textile treating compounds, and as emulsifiers and de-

emulsifiers. Availability: Limited quantities. Armour Chem. Div.

ARQUAD 2S—ARQUAD 2T

Dimethyl dialkyl quaternary ammonium salts in which the two long alkyl chains are derived from unsaturated fats. The unsaturation in the alkyl chains contributes better solubility in organic solvents, although it does not appreciably affect their water dispersibility. Both of these products are currently supplied at 75% active in isopropanol and at this concentration they are clear liquids at room temperature and remain flowable down to about 15°C. Arquad 2S is derived basically from soybean oil and Arquad 2T from tallow. Physical properties:

ARQUAD 2S ARQUAD 2T

Molecular Weight (Basis 100% Active)	585-605	585-605
Iodine Value (Basis 100% Active)	52-55	30-33
Color	Light tan	Light tan
Odor	Mild	Mild

They are miscible with most other cationic substances and with the non-ionic surfactants. They are not generally compatible with anionics such as soaps, alkyl sulfates and the alkyl aryl sulfonates. Both of these products can be mixed with oils and waxes. Suggested uses: Secondary oil recovery where corrosion problems exist with hydrogen sulfide and/or the effects of micro-organisms; dye-solubilization; acid corrosion inhibitors. Availability: Limited quantities. Armour Chem. Div.

ARSENIC (TRI) IODIDE

Arsenous Iodide, AsI₃, M.W., 455.67. Orange crystals. Light and heat sensitive. Very poisonous. Hydrolyzed by water. Soluble in excess HCl in CS₂, less soluble in CCl₄. Grades: technical, pure, N.F. VIII. Uses: Medicinal, analytical reagent. Availability: Laboratory scale. City Chemical Corp.

L-ASPARAGINE H₂O O.S. (Crystalline)

C₅H₉O₃N₂·H₂O. M.W., 150.1; spec. rot. [α]_D²⁵ 1.25. + 34.0 to + 35.0° (c = 2.24 in 3.4N HCl); optically standardized. Suggested uses: biochemical and nutritional research. Schwarz Laboratories, Inc.

D-ASPARTIC ACID O.S.

C₄H₇O₄N. M.W., 133.1; spec. rot. [α]_D²⁵ — 24.0 to — 25.0° (c = 2 in 6N HCl); optically standardized. Suggested uses: biochemical and nutritional research. Schwarz Laboratories, Inc.

BARIUM CITRATE

Ba₃(C₆H₅O₇)₂·7H₂O. M.W., 916.39. White, odorless powder. Loses H₂O on crystallization at 150°C. Insoluble in water and alcohol. Suggested uses: As a paint pigment. Availability: Experimental Quantities. Chemo Puro Mfg. Corp.

BARIUM-GLUCONATE

Ba(C₆H₁₁O₇)₂ MW., 527.4. White crystals. Soluble in water. Grades: Technical, C.P. Use: Preparation of other gluconates. Availability: Pilot-plant scale. City Chemical Corp.

BARIUM GLYCOLATE

Barium Hydroxyacetate. Ba(C₂H₃O₃)₂ M.W., 287.4. White crystals. Soluble in water. Grades: Technical, C.P. Availability: Pilot-plant scale. Uses: Preparing other glycolates. City Chemical Corp.

BEHENYL ALCOHOL—"ADOL 60"

Typical Specifications: Saturated Monohydric Alcohol, Approx. 85% C₂₂ Chain Length. Typical Analysis: M.W. = 308. Titer = 62.6°C.; I.V. = .7; Sap. Val. = 10; Hydroxyl Val. = 182.0; Fire Point = 435°F.; Viscosity = 210°F. 46. Suggested Uses: Lubricants, Surfactants, Chemical Intermediates and Chemical Synthesis. Availability: Experimental quantities from pilot plant production. Commercial quantities available early 1954. Archer-Daniels-Midland Co.

BENZALACETONE

Pale green or yellow crystals at room temperature or below. Conegealing point 37°C. min.

Availability: Experimental quantities immediately available; larger supplies readily arranged. New York Quinine and Chemical Works.

BENZALACETOPHENONE

C₁₅H₁₂O. M.W. 208; B.P. 175°(2mm.); M.P. 51°-52°C.; color, yellow. Chemical properties: The carbonyl group undergoes many of its usual reactions, but 1, 4-additions to the conjugated system occur in some cases. Suggested uses: Synthesis of pharmaceuticals and other organic chemicals. Availability: Pilot-plant quantities. The Trubek Laboratories.

BENZENE—NITRATION GRADE

F.P. 5.2 C or higher, contains less than 0.001 g. of thiophene per 100 ml by ASTM Test D-931; has bromine index less than 15. Commercially available. Sun Oil Co., Industrial Products Dept.

1,4-BIS (2-(5-PHENYLOXAZOYL)) BENZENE

Synonym: POPOP. C₁₆H₁₂·C₆HNO₂·C₆H₅. M.W. 364.39. M.P. 245-246°C. Color: pale greenish yellow sol. in toluene 0.12g./100g. Solutions fluoresce in ultraviolet light producing light of 4200A wavelength. Use: wavelength shifter in liquid scintillation counting. Availability, Laboratory scale. Arapahoe Chemicals, Inc.

BENZHYDRYL AMINE

C₁₃H₁₃N. M.W. 183; R.I. 1.5965 at 20°C.; B.P. 135°(1mm.); basicity, ml. N HCl/g. 5.65; color, water-white. Chemical properties: The hydrogen atoms of the amino group are readily displaced by alkyl or acyl groups. Suggested uses: Synthesis of pharmaceuticals. Availability: Pilot-plant quantities. The Trubek Laboratories.

BENZHYDRYL CHLORIDE

C₁₃H₁₂Cl. M.W. 202.5. S.P. 17°. R.I. 1.596 at 20°C.; B.P. 140°C. (3mm.); color, water-white to light straw. Chemical Properties: The chlorine is readily displaced by alkoxyl and alkylamino groups. Suggested uses: Synthesis of pharmaceuticals. Availability: Commercial quantities. The Trubek Laboratories.

BETA-(O-CHLOROANILINO) PROPIONITRILE

o-CIC₆H₄NHC₂H₂CH₂CN. M.W. 180. Clear colorless liquid turning to red color upon aging. B.P. 139-141°C. @ 0.3 mm. nD²⁵ 1.5734. Sp. Gr. 25/25°C. 1.2103. Soluble in alcohol, ether, acetone, benzene, chloroform. Insoluble in water, hexane. Availability: research quantities. Monsanto Chemical Company, Organic Chemicals Division.

BETAINE HYDROBROMIDE

C₅H₁₁NO₂·HBr. M.W. 198. Bromine contents 40.5%. Colorless, odorless crystalline powder. Very soluble in water, soluble in alcohol. Chemical properties: Both the Betaine as well as the HBr portions of the molecule are reactive. Suggested uses: In organic synthesis; in medicine as an alkali-free sedative. Availability: Small quantities for experimental investigations. Chemo Puro Mfg. Corp.

BETAINE HYDROIODIDE

C₅H₁₁NO₂·HI. M.W. 245. Iodine contents 51.5%. Odorless, practically white crystals. Very soluble in water, soluble in alcohol. Chemical properties: Both the Betaine as well as the HI portions of the molecule are reactive. Suggested uses: In organic synthesis; in medicine as a replacement for Alkali Iodides. Availability: In pilot plant quantities. Chemo Puro Mfg. Corp.

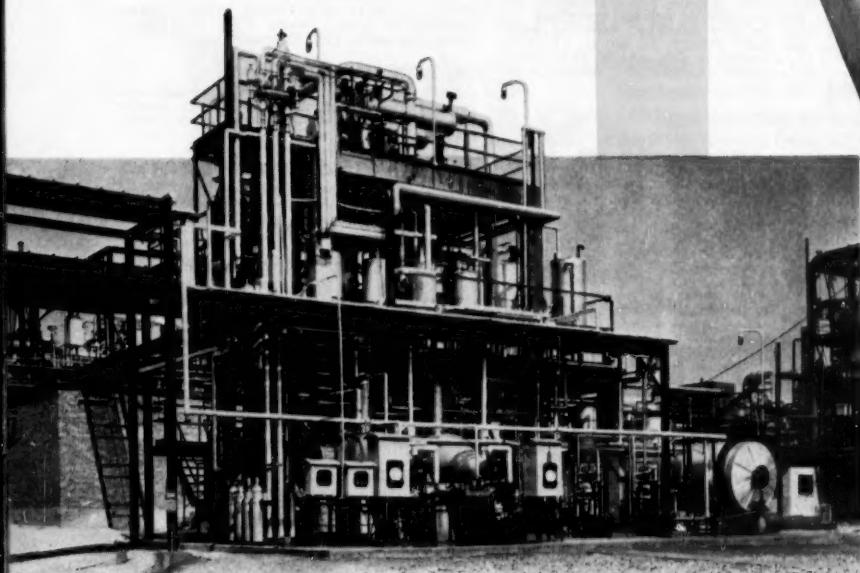
BIKITA* LEPIPOLITE

Lithium ore containing minimum 3.5% Li₂O. Excellent fluxing agent. Decreases the coefficient of expansion and increases the strength of glass, glazes, enamels and porcelains. Its content of lithium and fluorine, high total alkali and alumina, moderate silica and low iron are beneficial. Opacifier for opal or white glass. American Potash & Chemical Corp.

BIS(BETA-CHLOROETHYL)VINYLPHOSPHONATE

(CICH₂CH₂O)₂P(O)CH=CH₂. M. W. 233. Clear water white liquid with a mild pleasant odor. Sp. Gr. (25°/25°) 1.318. B.P. 132°C. @ 1mm. nD²⁵ 1.475. Soluble in common organic solvents and slightly soluble in water. Stable to hydrolysis. Availability: pilot plant quantities. Monsanto Chemical Co., Organic Chemicals Div.

WE MAKE IT CLEAR...



at our new Aniline Plant in Moundsville, W. Va.

Our new aniline produced at Moundsville, West Virginia
is water-white, extremely pure, uniform in analysis.

Made by a continuous catalytic hydrogenation process developed in
National Aniline Laboratories, this aniline sets a new standard
of quality. Automatic instrumentation assures absolute uniformity.

An ample supply of by-product hydrogen from an adjacent
Allied Chemical plant assures dependable output.

Users of aniline benefit also by our plant location on the Ohio River
(just below Wheeling) from which delivery can be made by
rail, truck or inland waterway. We will be pleased
to furnish samples, specifications and price quotations.



NATIONAL ANILINE DIVISION

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ALLIED CHEMICAL & DYE CORPORATION 40 Rector Street, New York 6, N. Y.



3,3'-BITOLYLENE-4,4'-DIISOCYANATE (TODI)



M.W. 264. M.P. 71-72°C. A white crystalline powder, soluble in benzene, ether, acetone, and chloroform. Worthy of investigating in reactions requiring a diisocyanate for the production of urethanes and ureas. Available in research and pilot plant quantities. National Aniline Div., Allied Chemical & Dye Corp.

BITOLYLENEDIISOCYANATE

(3,3'-Dimethyl 4,4'-biphenylenediisocyanate) OCN $(\text{CH}_3)_2\text{C}_6\text{H}_3(\text{CH}_3)\text{NCO}$. M.W. 264.28. Crystalline solid. M.P. 71-72°C. Soluble in benzene, toluene, and chlorinated solvents. Decomposes in water, alcohols, and other active hydrogen solvents. Chemical properties: Undergoes reaction with compounds having labile hydrogen: water, alcohols, mercaptans, acids, amines, etc. Suggested uses: Manufacture of rigid and flexible foams, elastomers, resins, fibers, and adhesives. Modification of polyesters, drying oils, natural and synthetic fibers, paper, and leather. Availability: Semi-commercial quantities. The Carwin Co.

BLACKTONE BLUE 50-4500

A high strength jet masstone iron blue for enamels, lacquers, and other uses. Sp. Gr. 1.76; wt./gal. 14.6; bulking value 0.0685; Oil Abs. 47. Excellent resistance to bleeding. Suggested uses: Paints; Automotive lacquers; other miscellaneous application. Commercially available. American Cyanamid Co., Pigments Div.

BLACKTONE MILORI BLUE 50-4020

A high strength iron blue for inks. Sp. Gr. 1.87; wt./gal. 15.6; bulking value 0.0640; Oil Abs. 37.4. Suggested applications: Letter press; lithographic; intaglio; moisture-set. Commercially available. American Cyanamid Co., Pigments Div.

BLACKTONE MILORI BLUE 50-4100

A soft grinding semi-black tone iron blue for inks, paints and other uses. Sp. Gr. 1.76; wt./gal. 14.7; bulking value 0.0681; Oil Abs. 44.8. Suggested uses: Inks; lithographic; rotogravure; and letter press; paints; enamels and miscellaneous; crayons; floor coverings; rubber. Commercially available. American Cyanamid Co., Pigments Div.

BONADUR RED Y 20-6440

A non-resinated Beta-oxo-naphthoic red. Sp. Gr. 1.76; wt./gal. 14.67; bulking value 0.0681; good color stability, and bleed resistance. Suggested uses: Ink; Lithography; metal decoration; Flexography. Others: Plastics, rubber; floor coverings; vinyl printing. Commercially available. American Cyanamid Co., Pigments Div.

BORIC OXIDE

Anhydrous boric acid (B_2O_3). Used in the manufacture of metallic borides for tools and dies and ferro alloys for special steels. Also, in the manufacture of boron carbide for abrasives and for the manufacture of various organic and inorganic boron compounds. High purity. Minimum 99% B_2O_3 . Hard, brittle, glass-like solid. Only slightly hygroscopic, in available forms (granular and flake). American Potash & Chemical Corp.

ELEMENTAL BORON

High purity, extremely fine particle size in micron range. Suitable for electronic research and other specialized applications. American Potash & Chemical Corp.

BORO-SPRAY*

A highly soluble borate, particularly adapted for spray applications to tree fruit and truck crops where boron deficiency is indicated. Free-flowing, stable product containing sodium penta-

borate $\text{Na}_2\text{B}_10\text{O}_{16}\cdot10\text{H}_2\text{O}$. Rapidly and completely soluble and compatible with most insecticides and fungicides. American Potash & Chemical Corp.

BOROTHERM*

A highly soluble boron compound for use in the preparation of fire retardant water base coatings. Useful also as a pH stabilizer and corrosion inhibitor in water base coating systems and as an agent to prevent the formation of thixotropic systems in aqueous clay dispersions. Stable, free-flowing, no fire hazard or toxic fumes on ignition. American Potash & Chemical Corp.

BRIC* 22 HYDROCARBON

Reinforcing type softener for black elastomeric compounds, both natural and synthetic. Minimizes shrinkage, confers high tear resistance, particularly at elevated temperatures, and is exceptionally resistant to petroleum oils and solvents. In the reclaim rubber industry improves processability in refining operations. In flake form for easy handling; softening point (Ring and Ball) 210-220 F.; Sp. G. 25/25 C. 1.26-1.35; insoluble in CS₂, wt. % 25-35. Commercially available—Barrett Div., Allied Chemical & Dye Corp.

α -BROMOBUTYRIC ACID

$\text{C}_4\text{H}_7\text{BrO}_2$; colorless, oily liquid. Sp. Gr. 25/25° C. 1.545 to 1.565 min.; assay, 98%. Sol. in alcohols or ethers. Commercially available. Chemical intermediate. Dow Chemical Co.

1,4-BUTANEDIOL

$\text{HOCH}_2\text{CH}=\text{CHCH}_2\text{OH}$. M.W. 90.1. Sp. G. 25°/15°C. 1.0154. F.P. 20.9°C. B.P. 228°C. RI 1.446. Clear colorless liquid completely soluble in water. Chemical properties: Gives typical glycol reactions; forms polyesters and polyurethanes; intermediate for dichlorobutane and tetrahydrofuran. Suggested uses: Intermediate in the preparation of synthetic fibers, nylon, plasticizers, resins, plastics. Physical properties have lead to its use as a solvent and humectant in inks. Availability: Semi-commercial quantities. General Aniline & Film Corp.

2-BUTENE-1,4-DIOL

$\text{HOCH}_2\text{CH}=\text{CHCH}_2\text{OH}$. M.W. 88.1. Sp. G. 25°/15°C. 1.070. F.P. 12.5°C. B.P. 234°C. RI 1.4765. Clear colorless liquid, essentially odorless. Very soluble in water. Chemical properties: Reacts as a glycol and double bond gives addition reactions; forms polyesters, dihalohexamers. Yields dihydrofuran and erythritol. Suggested uses: Intermediate for polymers, plasticizers, and pharmaceuticals. Availability: Large laboratory quantities. General Aniline & Film Corp.

N-BUTYL CYCLOHEXYLAMINE

$\text{C}_8\text{H}_{17}\text{NHCH}_2\text{C}_6\text{H}_5$. M.W. 155.28. Sp. G. 0.8439 at 20°/20°C.; B.P. 209.5°C. (760 mm.); V.P. 0.2 mm. Hg at 20°C.; Fr. P. -45°C.; Visc. 2.2 cps. at 20°C.; sol. in water 0.14%; at 20°C. 0.5% at 20°C.; sol. in acetone, benzene, ethyl ether, heptane, methanol, and carbon tetrachloride; odor, mild; ammoniacal; color, water white. Chemical properties: Undergoes reactions typical of secondary amines. Suggested uses: Alkaline organic solvent; extractant for acidic materials; acid acceptor; intermediate for pharmaceuticals, rubber chemicals, and corrosion inhibitors. Availability: Research quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

BUTYL DECYL PHthalATE ("ELASTEX" 40-P PLASTICIZER)

$\text{C}_{22}\text{H}_{34}\text{O}_4$. M.W. 362.5; clear liquid; color (Hazen) 50. Max.; Sp. Gr. 20/20C. 0.997±0.003. Excellent secondary plasticizer for PVC and PVC-PVAc copolymer resins. May also be used to advantage in the formulation of plastisols and barretosols. Available in commercial quantities. Barrett Division, Allied Chemical & Dye Corp.

BUTYL OXALATE

Synonym: Diethyl Ethanedioate. $\text{C}_{10}\text{H}_{18}\text{O}_4$. M.W. 202.25. Colorless liquid. B.P. 243°C. Insoluble in water, miscible with alcohol. Suggested uses: As an intermediate in the manufacture of organic chemicals and as a solvent. Availability: Experimental quantities. Chemico Puro Mfg. Corp.

**BUTYLENE OXIDES
(Straight Chain)— $\text{C}_4\text{H}_8\text{O}$**

M.W. 72.1; B.R. at 760 mm. Hg. 5 to 95%. 60-67°C.; Sp. Gr. 25/25. 0.8259; R.I. at 25°C. 1.3808; Flash point, 5°F. Fire Point, 5°F. Color, APHA, 30; Water, max., 0.25%; Aldehydes (as butyraldehyde), max., 0.50%. Chlo-

rides (as Cl), max., 0.20%; Isobutylene oxide (by infrared analysis), max., 1.0%. Used as an intermediate for Polyglycols and Dowanol type compounds. Surface active properties. Commercially available. Dow Chemical Co.

BUTYROLACTONE

$\text{CH}_2\text{CH}_2\text{CH}_2\text{COO}$, M.W. 86.09. Sp. G. 25°/4°C. 1.124. F.P. -44°C. B.P. 204°C. R.I. 1.435. Clear colorless liquid with a mild odor. Completely soluble in water, acetone, benzene, ethyl ether. Chemical properties: Reacts with bases, alcohols, halogen acids, amines to give derivatives of γ -aminobutyric acid. Suggested uses: Solvent for polyacrylonitrile, cellulose acetate, polystyrene and many other resins. Selective solvent for acetylene in natural gas. Chemical intermediate for aliphatic and cyclic compounds. Availability: Semi-commercial quantities. General Aniline & Film Corp.

CADMUM SELENITE

$\text{CdSeO}_4\cdot2\text{H}_2\text{O}$ M.W. 266.4. White powder. Insoluble in water. Grade: C.P. Availability: Laboratory scale. City Chemical Corp.

CADMUM SELENATE

$\text{CdSeO}_4\cdot2\text{H}_2\text{O}$ M.W. 291.4. White crystals. Soluble in water. Decomposes at 100°C. Grade: C.P. Availability: Laboratory scale. City Chemical Corp.

CALCIUM (ORTHO) XYLENE SULFONATE

$[(\text{CH}_3)_2\text{C}_6\text{H}_3\text{SO}_3]_2\text{Ca}$ M.W. 410.50. White crystals; Readily soluble in water. Grade: C.P. Availability: Laboratory scale. City Chemical Corp.

CALCO SOLUBLE VAT BROWN BY

Calco Soluble Vat Brown BY is a soluble leuco ester form of Vat Brown. It is different in shade than any competitive Soluble Vat Brown on the market. It is a versatile printing color suitable for roller or screen printing alongside of azoic, pigments or other soluble vats where acid ageing is used. The excellent leveling properties of this product offer the dyer of cotton, rayon and linen dress goods and shirtings superior appearance of the finished fabric. Commercially available, American Cyanamid Co., Organic Chemicals Div., Dyestuffs Dept.

CALCOFLUOR WHITE MST

Calcofluor White MST is a new textile whitening agent. Its action is similar to other Calcofluor Whites in that it has a blue fluorescence when applied to cellulosic fabrics and viewed under ultra-violet light. In ordinary light such as daylight, this blue fluorescence can not be seen as such but is still present and acts to enhance the whiteness of white materials or brighten the shades of many pastels. Commercially available, American Cyanamid Co., Organic Chemicals Div., Dyestuffs Dept.

CALCOMINE YELLOW 6G

Calcomine Yellow 6G is a green shade alkali fast stilbene yellow which corresponds to Color Index No. 622 but is slightly greener and brighter in shade. Commercially available. American Cyanamid Co., Organic Chemicals Div., Dyestuffs Dept.

CALCOMINE YELLOW 8G

Calcomine Yellow 8G is a stilbene yellow but differs from anything previously available in that it is an extremely green-shade yellow which can be blended with other redder stilbene yellows to make a complete range of yellow shades extending into the heretofore inaccessible extreme green shade. Calcomine Yellow 8G is in the very green shade range of Auramine and Direct Chinoline. Commercially available. American Cyanamid Co., Organic Chemicals Div., Dyestuffs Dept.

CALCOSOL FAST YELLOW GL PASTE

Calcosol Fast Yellow GL Paste is a patented, homogeneous dyestuff and possesses outstanding fastness to light, even in pale shades, as well as on viscose rayon, both as a self shade and when resin-treated. Calcosol Fast Yellow GL Paste is suitable for use on packages, skeins, rawstock, warps, and piece goods. It can be used to advantage on sheetings, shirtings, bed-spreads, corduroy, draperies, towels, viscose piece goods, cotton flannel and a host of other fabrics which demand the best in fastness requirements. Commercially available. American Cyanamid Co., Organic Chemicals Div., Dyestuffs Dept.

CANNA RED 20-4065

A metal precipitated acid azo pigment in the yellow-red shade. Sp. Gr. 1.66; wt./gal. 13.83; bulking value 0.0722; Oil Abs. 38; livering—



LOW-COST INTERMEDIATES IN TANK-CAR QUANTITIES

This versatile trio represents the most economical source of the amine group because of their low equivalent weights and moderate prices. Marketed by CSC in both anhydrous and aqueous forms, they are available for shipment in large-volume quantities (tank cars) as well as in drums and smaller containers. Write for latest Technical Data Sheet. Industrial Chemicals Sales Dept., Commercial Solvents Corporation, 260 Madison Avenue, New York 16, N. Y.

MONOMETHYLAMINE CH_3NH_2

Uses

Manufacture of amide and sulfonated amide-type detergents and surfactants. Synthesis of caffeine, aminophylline and desoxyephedrine. Manufacture of photographic chemicals, the explosive tetryl, amide-type plasticizers, ion-exchange resins, corrosion inhibitors and paint removers.

Properties

Molecular Weight	31.06
Boiling Point at 760mm, °C	- 6.79
Flash Point, Tag Open Cup, °F	34 (30% sol)
Density at 20°C	0.912 (30% sol)
Weight per U.S. Gallon at 68°F, lbs.	7.6 (30% sol)

DIMETHYLAMINE $(\text{CH}_3)_2\text{NH}$

Uses

Raw material in manufacture of thiuram sulfide-type vulcanization accelerators and of dimethyldithiocarbamic acid salts used as fungicides. Neutralizing and solubilizing agent in preparation of concentrated solutions of 2,4-D salts. Manufacture of anti-malarials.

Properties

Molecular Weight	45.08
Boiling Point at 760mm, °C	6.88
Flash Point, Tag Open Cup, °F	54 (25% sol)
Density at 20°C	0.921 (25% sol)
Weight per U.S. Gallon at 68°F, lbs.	7.7 (25% sol)

TRIMETHYLAMINE $(\text{CH}_3)_3\text{N}$

Uses

Preparation of long-chain quaternary ammonium compounds used as softeners, lubricants and waterproofing agents for textiles. Used with benzoyl peroxide to "set" methacrylate resins. Synthesis of cationic surface-active agents.

Properties

Molecular Weight	59.11
Boiling Point at 760mm, °C	2.87
Flash Point, Tag Open Cup, °F	38 (25% sol)
Density at 20°C	0.913 (25% sol)
Weight per U.S. Gallon at 68°F, lbs.	7.6 (25% sol)

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Chicago Colosseum October 12-15.
See the new CSC exhibit — Booth 169.



COMMERCIAL SOLVENTS

CORPORATION

C W Report

OK. Suggested applications: In inks for letter press and comics. Commercially available. American Cyanamid Co., Pigments Div.

3-CARBETHOXY-4-HYDROXYCOUMARIN

White to gray solid; M.P. 100-103°C.; loss on drying 1.0% max.; sulfated ash 1.0% max. Availability: Experimental quantities immediately available; larger supplies readily arranged. New York Quinine and Chemical Works.

"CARBOWAX"® POLYETHYLENE GLYCOL 20M

A high-molecular weight polyethylene glycol, M.W. 15,000-20,000 approx.; softening point, 59°C.-61°C.; melt. visc., 900-1100 poises at 210°F.; Visc. of 5% aqueous sol., 1549 cps. at 68°F., 553 cps. at 100°F.; sol. in water, 55 gm./100 ml. at 25°C.; color of 25% aqueous sol., 150-200 Pt.C. pH of 5% aqueous sol., 5.6. "Carbowax" Compound 20M is a water-soluble solid that forms stronger and more flexible films than the commonly available lower molecular weight polyethylene glycols. It is highly water soluble, slightly soluble in aromatic hydrocarbons, and insoluble in aliphatic hydrocarbons. It is compatible with nitrocellulose and methyl cellulose, but only partially compatible with polyvinyl alcohol, carboxymethyl cellulose, sodium alginate, and hydroxyethyl cellulose. Suggested uses: As a thickening, binding, and suspending agent in textile, paper, ceramic, and specialty product applications. Availability: research quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

CARTERET RED 20-7250

A metal precipitated acid azo. Sp. Gr. 1.89; wt./gal. 15.75; bulking value 0.0635. Good to excellent color stability. Suggested applications: Ink, letter press, moisture-set. Commercially available. American Cyanamid Co., Pigments Division.

CASTORWAX® MP70

Partially Hydrogenated Castor Oil (12-Hydroxystearin), M.W., 932. Waxy, white solid in the form of thin flakes. Color, 3+; Acid Value, 1.3; Sap. Value, 181; Iodine Value, 32; Hydroxyl Value, 152; Melting Point, °C., 69.74. Availability: semi-commercial. The Baker Castor Oil Co.

CASTORWAX® MP80

Partially Hydrogenated Castor Oil (12-Hydroxystearin), M.W., 932. Waxy, white solid in the form of thin flakes. Color, 3+; Acid Value, 1.3; Sap. Value, 181; Iodine Value, 16; Hydroxyl Value, 152; Melting Point, °C., 80-84. Availability: semi-commercial. The Baker Castor Oil Co.

CATIONIC SP

$C_{17}H_{35}CONH(CH_2)_2N(CH_3)_2CH_2CH_2OH$

PO_4 , M.W. 511. Offered as a 35% solution in an isopropyl alcohol-water mixture. Solution properties: light amber in color, pH 6 to 8, miscible with water, acetone and methanol, compatible in all proportions with nonionics and other cationics and non-corrosive. Product is exceptionally stable to acids and alkalies. Potential applications: Anti-stain agent for textiles, plastics, paper, surface coatings, glass and other materials; dyeing auxiliary; deflocculating, dispersing, settling and emulsifying agent. Available in development quantities. American Cyanamid Co.

PENNSALT CATTLE DIP EMULSION CONCENTRATE

An emulsion concentrate containing 60.9% Toxaphene and a special emulsifying agent which allows PENNSALT CATTLE DIP to maintain its excellent homogeneous quality with the minimum of agitation throughout the life of the bath. It is used for the control of ticks, hornflies, human bot flies and lice on livestock. It is especially formulated for the preparation of stable emulsions upon mixing with water

and can be used either in dip vats or as a spray. Commercially available. Pennsalt International Corp.

"CELLOSIZE"® HYDROXYETHYL CELLULOSE WP-09

A white to light tan, water-soluble, free-flowing powder. Visc. of 5% aqueous sol., 50-150 cps. at 20°C.; pH of 2% aqueous sol., 6.8. Suggested uses: As a water-soluble, film forming agent and colloidal stabilizer with applications in textiles, plastics, cosmetics, paints, adhesives, and ceramics. Of particular interest as a stabilizer for emulsion polymerization of vinyl acetate and other monomers, and as a protective colloid in the final resin emulsion. Availability: Commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

"CELLOSIZE"® HYDROXYETHYL CELLULOSE WP-3

A white to light tan, water-soluble, free flowing form of hydroxyethyl cellulose. Visc. of 5% aqueous sol., 250-350 cps. at 20°C.; pH of 2% aqueous sol., 6.8. Suggested uses: As a protective colloid and thickener with applications in textiles, cosmetics, paints, adhesives, and ceramics. Of particular interest as a protective colloid and thickener in polyvinyl acetate and other synthetic resin emulsions. Availability: Commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

CET

A non-resinizing agent for imparting durable stabilization to textiles to withstand laundering and to impart crease resistance—both for the life of the fabric. Commercially available. Onyx Oil & Chemical Co.

CHASE 24% LEAD NAPHTHENATE SPECIAL

Comparable to regular grades of 24% Lead Napthenate except darker in color: approx. 15 (G-H); metal: 23.8%-24.2%; viscosity: A (G-H) (typical); odor: mild. Stability, solubility, and drying power equal to lighter colored lead napthenate driers. For use in paint, varnish, linoleum, etc., formulations. An economical source for lead drier. Commercially available. Chase Chemical Corp.

p-CHLOROBENZHYDRYL CHLORIDE

$C_13H_{10}Cl_2$, M.W. 237; R.I. 1.600 at 20°C.; B.P. 145°C. (3 mm.); color, water-white to light-straw. Chemical properties: the non-nuclear chlorine atom is readily displaced by alkoxyl or alkylamino groups. Suggested uses: Synthesis of pharmaceuticals. Availability: Commercial quantities. The Trubek Laboratories.

3-CHLOROCOUMARIN

F.P. (min.); 118°C. by infra red, 91.8-93.3% by wt. Slightly yellow crystalline solid. Used in tin plating solutions. Commercially available. Dow Chemical Co.

4-CHLORO-8-METHOXYSQUINOLINE

Min. 98%; white, yellow, or very light tan crystals; M.P. 78-81°C.; soluble in acetone, chloroform, alcohol; sparingly soluble in toluene, xylene, ligroin (60°-90°); insoluble in water, alkalies, and dilute acids; soluble in 50% sulfuric acid; residue on ignition negligible. Availability: Experimental quantities immediately available; larger supplies readily arranged. New York Quinine and Chemical Works.

2-CHLORO-4-NITROPHENOL

$2\text{-Cl}-4\text{-NO}_2\text{-C}_6\text{H}_3\text{OH}$, M.W., 128.56. Light tan solid. Irritating odor. C.P. 106°C. min. Neut. Equiv. 173. Soluble in acetic acid, sulfuric acid, ethyl alcohol, acetone, chlorobenzene. Very slightly soluble in water. Availability: Research quantities. Monsanto Chemical Co., Organic Chemicals Division.

CHLOROPHENESIN

Synonym: p-Chlorophenylglyceryl Ether $C_9H_{11}O_3Cl$, M.W. 202. Colorless, practically odorless crystalline powder. M.P. 80°C. B.P. 214°C/19 mm. Soluble in water 0.6 gm. per 100 cc. @ 25°C.; soluble in organic solvents. Suggested use: As a preservative and fungicide in medicine and cosmetics. Availability: Experimental quantities. Chemo Puro Mfg. Corp.

p-CHLOROTHIOPHENOL



Mol. Wt. 144.61, M.P. 51.5°C. minimum. Ash 0.1% maximum, Assay 99% minimum. p-Chlorothiophenol has been used in the synthesis of potential anti-malarials /1/ and may be used to prepare mixed disulfides. These disulfides have been suggested as fungicides, insecticides, and oil additives /2/. By analogy with chlorophenol, p-chlorothiophenol should be a good intermediate in the synthesis of herbicides /3/, fungicides /4/, and insecticidal synergists /5/. The products obtained from the reaction of p-chlorothiophenol with the various phosphorous and sulfur chlorides and oxychlorides are also expected to have possibilities as insecticides, plasticizers, stabilizers, and oil additives. Evans Chemicals, Inc.

CHLOROTRIFLUOROETHYLENE

$CClF=CF_2$, M.W., 116.48. Boiling point, -27.9°C. Freezing point, -157.5°C. Liquid density at 20°C., 1.305 grams/cc. Critical density, 0.55 grams/cc. Critical temperature, 107°C. Critical pressure, 39.0 atm. Heat of vaporization at boiling point, 5400 cal./gram mol. Chlorotrifluoroethylene (CTFE) is a completely halogenated olefin with sufficient reactivity to readily undergo polymerization and to be valuable as a chemical intermediate in the plastics industry. It behaves as a typical ethylenic compound in addition and condensation reactions, and is oxidized by potassium permanganate. The polymerization can be controlled to give a dimer, low molecular weight oils or high molecular weight solid polymers. It is a colorless gas with a faint ethereal odor. Availability: Commercial quantities. "Kinetic" Chemicals Division, E. I. du Pont de Nemours & Co., (Inc.)

CHROME YELLOW MEDIUM 40-4550

A high lead chromate type possessing a red shade. Sp. Gr. 6.11; wt./gal. 50.9; bulk density 0.0197; Oil Abs. 14.0. Suggested applications: In paint specification requiring high lead chromate content. Commercially available. American Cyanamid Co., Pigments Division.

FCC CHROMIC CHLORIDES

Now available in Technical Pure (T.P. Grade) in commercial quantities, with Following Specifications:

Appearance:	Basis liquid	I.G. 28%	I.G. 31%
Assay:	dark green	dark green	dark green
Basicity:	27.6% as $Cr(OH)Cl_2$	31.2% as $CrCl_3$	31.2% as Cr_2O_3
Specific gravity	15% as Cr_2O_3	15% as Cr_2O_3	O
lbs./gal.	33%	approx. 4%	approx. 4%
NaCl	approx. 0.2%	less 0.2%	less 0.2%
Na ₂ SO ₄	1.3576	1.387	1.387
T.P. 37%	11.3	11.5	11.5
App.:	liquid	fine crystal.	T.P.
Assay:	dark green	dark green	dark green
Basicity:	37% as Cr_2O_3	99.101% as $CrCl_3 \cdot 6H_2O$	99.101% as $CrCl_3 \cdot 6H_2O$
Specific gravity	28.5% as Cr_2O_3	28.5% as Cr_2O_3	28.5% as Cr_2O_3
NaCl	less 0.1%	less 0.1%	less 0.1%
Na ₂ SO ₄	less 0.1%	less 0.1%	less 0.1%
lbs./gal.	1.407	1.237	1.237
	11.75	10.3	10.3

Uses: Preparation of chromium salts, as textile mordant, in metal plating and finishing solutions. Fiber Chemical Corp.

FCC CHROMIC FORMATE

Specifications: Basic I.G. 21%
Formula: $[Cr(OH)(HCOO)]_2$
Molecular weight: 159.03
Appearance: dark green liquid
Assay: 21% $Cr(OH)(HCOO)$
Basicity: 100% as Cr_2O_3
 H_2O 33% max.
 SO_4 0.2% max.
C1 4.2% max.
Spec. gravity 20°C 1.237
lbs./gal. 10.3

Specifications: Basic T.P.
Formula: $[Cr_3(OH)_2(HCOO)_6] \cdot HCO_2 \cdot 2H_2O$
Molecular weight: 541.10
Appearance: green powder

Assay: 99.100% as $[Cr_3(OH)_2(HCOO)_6] \cdot HCO_2 \cdot 2H_2O$
28.55-28.83% as Cr_2O_3
41.72-42.14% as Cr_2O_3

Basicity: 22.20% max.
 H_2O 1% max.
 SO_4 0.1% max.
Cl 0.005% max.
Spec. gravity 20°C 3.5
lbs./gal.

Uses: Tanning agent, Textile mordant, Man-

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Where to look



If you want to improve your products — or if you are having process troubles, try upgrading your starting materials.

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C W Report

Manufacture of chrome chemicals. Fiber Chemical Corp.

FCC CHROMIC NITRATE T.P. 50%

Formula: $\text{Cr}(\text{NO}_3)_3$. Appearance: Violet-green liquid. Assay: 50.6% as $\text{Cr}(\text{NO}_3)_3$, 15.8% as Cr_2O_3 . Basicity: 0. Impurities: SO_4^{2-} 0.03 max., Cl^- 0.005 max., pH (10% solution) 2.2, Spec. gravity 20°C. 1.513, lbs./gal. 12.50. Commercially Available. Fiber Chemical Corp.

FCC CHROMIC NITRATE ACETATE T.P.

Formula: $\text{Cr}_2(\text{NO}_3)_3(\text{CH}_3\text{COO})_4(\text{OH}) \cdot 8\text{H}_2\text{O}$. Appearance: green powder. Assay: 100% as $\text{Cr}_2(\text{NO}_3)_3(\text{CH}_3\text{COO})_4(\text{OH}) \cdot 8\text{H}_2\text{O}$, 27.15% as Cr_2O_3 . Basicity: 17%. Solubility: 100 gram water dissolve 65 gram. Use: in textile printing. Commercially Available. Fiber Chemical Corp.

FCC CHROMIC POTASSIUM FLUORIDE

Now available in Technical Pure (T.P. Grade) in commercial quantities, with following specifications: Formula: $\text{K}_2\text{CrF}_5 \cdot \text{H}_2\text{O}$. App. appearance: light green powder. Molecular weight: 243.2, Assay: 98.99% as $\text{K}_2\text{CrF}_5 \cdot \text{H}_2\text{O}$. Chrome (Cr): 21% Fluoride (F): 38.4% Potassium (K): 31.6% Moisture: 1-2%. Solubility: insoluble in water, soluble in acids. Toxicity: Chromic Potassium Fluoride is poisonous, may be fatal if swallowed. Fiber Chemical Corp.

FCC CHROMIC SULFATE T.P. 7½ POWDER

Now available in Technical Pure (T.P. Grade) in commercial quantities, with following specifications: Formula: $\text{Cr}_2(\text{SO}_4)_3 \cdot n\text{H}_2\text{O}$ (7-8). Appearance: green powder. Assay: 70.75% as $\text{Cr}_2(\text{SO}_4)_3$, 27.29% as Cr_2O_3 , 96.10% as $\text{Cr}_2(\text{SO}_4)_3 \cdot 7\frac{1}{2}\text{H}_2\text{O}$. SO_4^{2-} 51.4-52.1%, H_2O 25-30% (crystal water). Chlorides (Cl^-) 0.005% max., Iron (Fe) 0.01% max., Alkalies and earths 0.10% max., Insolubles (in water) 0.15%, insoluble in alcohol. Bulk weight: 8.25 lbs./gal. Fiber Chemical Corp.

CHROMYL CHLORIDE, TECHNICAL

CrO_2Cl_2 , M.W. 154.92; Sp. Gr. 1.9145 at 25°/4°C; F.P. 96.5°C; B.P. 115.7°C. Cherry red liquid. Miscible with CCl_4 , $\text{C}_2\text{H}_5\text{Cl}$, $\text{C}_2\text{H}_4\text{Cl}_2$, C_2H_5 , $\text{C}_6\text{H}_5\text{NO}_2$, CH_3COOH , $(\text{CH}_3\text{CO})_2\text{O}$, CH_3COCl , SOCl_2 , CS_2 , SnCl_4 , Br_2 and similar liquids. I_2 and Cl_2 are somewhat soluble. Dissolves most non-polar compounds, forming stable solutions with those relatively inert like $\text{p-C}_6\text{H}_4\text{Cl}_2$; paraffins are soluble but may react; olefins and other reactive compounds may ignite. Polar compounds are insoluble. CrO_2Cl_2 dissolves to 10% by weight at rm. temp. Stable well above b.p. in absence of light and moisture. Hydrolyzes in water forming chloride, chromate and chlorochromate. Decomposes slowly in light, yielding chlorine and chromic chromates in partly solidified mass. Suggested Uses: Selective oxidation or chlorination in non-aqueous medium, either liquid or vapor phase. Organic synthesis, e.g. Etard reaction converting methyl group on aromatic nucleus to aldehyde. Igniter for gasoline or kerosene in absence of atmospheric oxygen. Available in pilot plant quantities 98% CrO_2Cl_2 minimum. Mutual Chemical Co. of America, Research and Development Division.

CLARIION ORANGE 45-350

A metal precipitated acid azo type-resinated. Sp. G. 1.77; wt./gal. 14.75; bulking value 0.0678; Oil Abs. 38.7. Suggested applications: Moderately transparent for letterpress or intaglio and metal decoration. Not stable in water-based inks; paint specialties; rubber. Commercially available. American Cyanamid Co., Pigments Division.

PENNSALT CLEANER K-8

Powdered alkaline compound for electrolytic cleaning of steel prior to electroplating. New combination of alkaline detergents and surface-active agents give outstanding removal of mill oil, shop soils and particularly smut. Commercially available through Metal Processing Dept., Pennsylvania Salt Manufacturing Co.

PENNSALT CLEANER 38

Improved alkaline cleaner for use in spray wash machines. Detergency and soil removal properties have been increased without objectionable foam. Recommended for spray cleaning of ferrous metals prior to porcelain enameling and other finishing operations. Commercially available through Metal Processing Dept., Pennsylvania Salt Manufacturing Co.

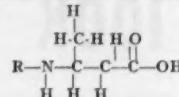
PENNSALT CLEANER 74

A powdered, non-silicated alkaline cleaner for use in continuous cleaning machines prior to electrolytic plating of steel. Compounded with selected alkaline detergents and a synergistic combination of surface active agents. Commercially available through Metal Processing Dept., Pennsylvania Salt Manufacturing Co.

PENNSALT CLEANER 82

A non-silicated heavy duty metal cleaner with high phosphate content and a special combination of synergistic synthetic detergents. Formulated to give maximum detergent action, long life and good rinsability. Pennsalt Cleaner 82 is used for removing tenacious, dried-on soils and mill oil from steel prior to porcelain enameling, phosphatizing, painting and other finishing operations. Commercially available through Metal Processing Dept., Pennsylvania Salt Manufacturing Co.

N-COCO-BETA AMINO BUTYRIC ACID



Zwitterion—50-55% aqueous gel. Free flowing gel at room temperatures, melts to a clear liquid at 45-55°C. pH (50% solution)—5.5. Specific gravity—0.9. Effect of Heat—Product can be concentrated by boiling off water at 100-110°C. Higher temperatures cause decomposition. Purification—The Zwitterion can be purified by titrating with cold acetone. Solubility at 20°C—Water: Not completely miscible. Soluble in the ranges of 0% to 3% and 50% to 70%. In other solvents—Soluble in ethanol, methanol, isopropanol, N propanol, glycerol, polyethylene glycol derivatives (including non-ionic liquid detergents), ethyl acetate, acetone (slight; very soluble hot), ethyl ether, dioxane. Dispersible in carbon tetrachloride, chloroform, benzene, xylene. Insoluble in petroleum ether, Skellysolves, ligroin, kerosene, mineral spirits. Suggested uses: Sodium salt of this substituted amino acid is an excellent suds and foam stabilizer for synthetic detergents and actually improves detergent properties. Availability: Limited quantities. Armour Chemical Div.

COPPER (II) FORMATE

Cupric Formate $\text{Cu}(\text{CHO}_2)_2 \cdot 2\text{H}_2\text{O}$ M.W. 225.64. Blue crystals. Soluble in water, slightly in alcohol. Grades: technical, C.P. Availability: Pilot plant scale. Uses: Catalyst. City Chemical Corp.

PENNSALT CONCRETE NEUTRALIZER NO. 1

A non-aqueous acid neutralizing agent designed for the acid treatment of concrete surfaces that are to be later coated or pointed with resin type cements. This product eliminates the usually required washing and long waiting period for drying after the usual types of neutralization treatments. Commercially available: Pennsylvania Salt Manufacturing Co.

CORROSION INHIBITOR OIL ADDITIVE—ATPET 100

Sorbitan mono fatty acid ester, essentially 100% active. An oily liquid soluble in most petroleum products. Employed as an oil additive for rust protection of ferrous surfaces such as: internal and external parts of jet, diesel, and gasoline engines, turbines, and component parts of machinery. May also be used as a fuel additive. Commercially available. Atlas Powder Co.

CORROSION INHIBITOR X141

Oily liquid; amber color; slight fatty odor; 100% active; insoluble in alcohol, mineral and vegetable oils, aliphatic and aromatic solvents. Recommended as an additive for rust preventative oils and slushing compounds. Commercially available. Kessler Chemical Co., Inc.

2-CYANOPYRIDINE

$\text{C}_6\text{H}_4\text{N}_2$ M.W. 104 M.P. 28°C. Sl.sol. Water.

Is hydrolyzed to Picolinic Acid by acids or alkalis. Uses: In the manufacture of 2-substituted pyridines. Availability: Experimental quantities. Eastern Chemical Corp.

CYCLAMINE 8 [METHYLCYCLOHEXYL AMINE-(MIXED ISOMERS)]

$\text{C}_8\text{H}_{15}\text{NH}_2$, M.W. 127.2; Sp. G. 0.8934 at 20°/20°C.; B.P. 185.6°C. (760 mm.); V.P. 0.7 mm. Hg at 20°C.; Fr. P., sets to glass below -90°C.; sol. in water, 0.4% at 20°C.; sol. water, in 43% at 20°C.; Visc., 2.3 cps. at 20°C.; odor, sharp, ammoniacal; color, yellow. Chemical properties: Cyclic eight carbon primary amine. Enters into typical reactions of primary amines. Suggested uses: Preparation of oil demulsifiers, corrosion inhibitors, surface-active agents, oil additives, and rubber chemicals. Availability: research quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

CYCLAMINE E8 (2, 5-ENDOMETHYLENE CYCLOHEXYLMETHYL AMINE)

$\text{C}_8\text{H}_{15}\text{NH}_2$, M.W. 125.2; Sp. G. 0.9419 at 20°/20°C.; B.P. 185.9°C. (760 mm.); V.P. 0.7 mm. Hg at 20°C.; Fr. P., sets to glass below -90°C.; sol. in water, 0.24% at 20°C.; sol. water, in 41.3% at 20°C.; Visc., 4.3 cps. at 20°C.; odor, characteristic amine, color, pale yellow. Chemical properties: Cyclic eight carbon primary amine. Undergoes typical reactions of primary amines. Suggested uses: Preparation of oil demulsifiers, corrosion inhibitors, surface-active agents, oil additives, and rubber chemicals. Availability: research quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

CYCLETHRIN [3-(2-CYCLOPENTENYL)-2-METHYL-4-OXO-2-CYCLOPENTENYL CHRYSANTHEMUM MONOCARBOXYLATE]

M.W. 760.4; Sp. G. 1.020 at 20°/20°C., R.I. 1.5170 at 30°C.; straw-colored liquid. Cyclethrin is an insecticide for flies, mosquitoes, gnats and certain agricultural insect pests. It is closely related in chemical structure and similar in insecticidal activity to pyrethrins and allethrin and has a very low order of mammalian toxicity. Suggested for trial in oil sprays and aerosols for household and industrial use; in oil and water sprays to control parasites on livestock; in production of insect-resistant packaging materials; in grain protectant dusts; and on agricultural crops, particularly near harvest time. Availability: research quantities for further testing within statutory limitations. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

CYCLOHEXANOL—(HEXALIN)— $\text{C}_6\text{H}_{12}\text{O}$

B. R. at 760 mm. Hg, 5 to 95%, 155 to 205°C. Solvent for rubber, nitrocellulose, used in textile finishing as an insecticide and chemical intermediate. Commercially available. Dow Chemical Co.

CYCLOHEXENE— C_6H_{10}

M. W. 82.1; B. R. at 760 mm. Hg, 5 to 95%, 82.5 to 85.0°C; Purity by Br_2 absorption min. 98%; Sp. Gr. at 25/25, 0.808; F. P. below 20°C.; R. I. at 25°C., 1.445; Flash point, below 20°C. Commercially available. Dow Chemical Co.

CYCLOHEXYL CHLORIDE

$\text{C}_6\text{H}_5\text{Cl}$ M.W. 118.61; B.P. 141-143°C; R.I. 1.4600; Sp. G. 0.9923 at 25°. Reactive secondary chloride, recommended in reactions such as the Grignard reaction where yields are much greater than are attained with the bromide. Availability: Semi-commercial. Arapahoe Chemicals, Inc.

p—CYCLOHEXYLPHENOL

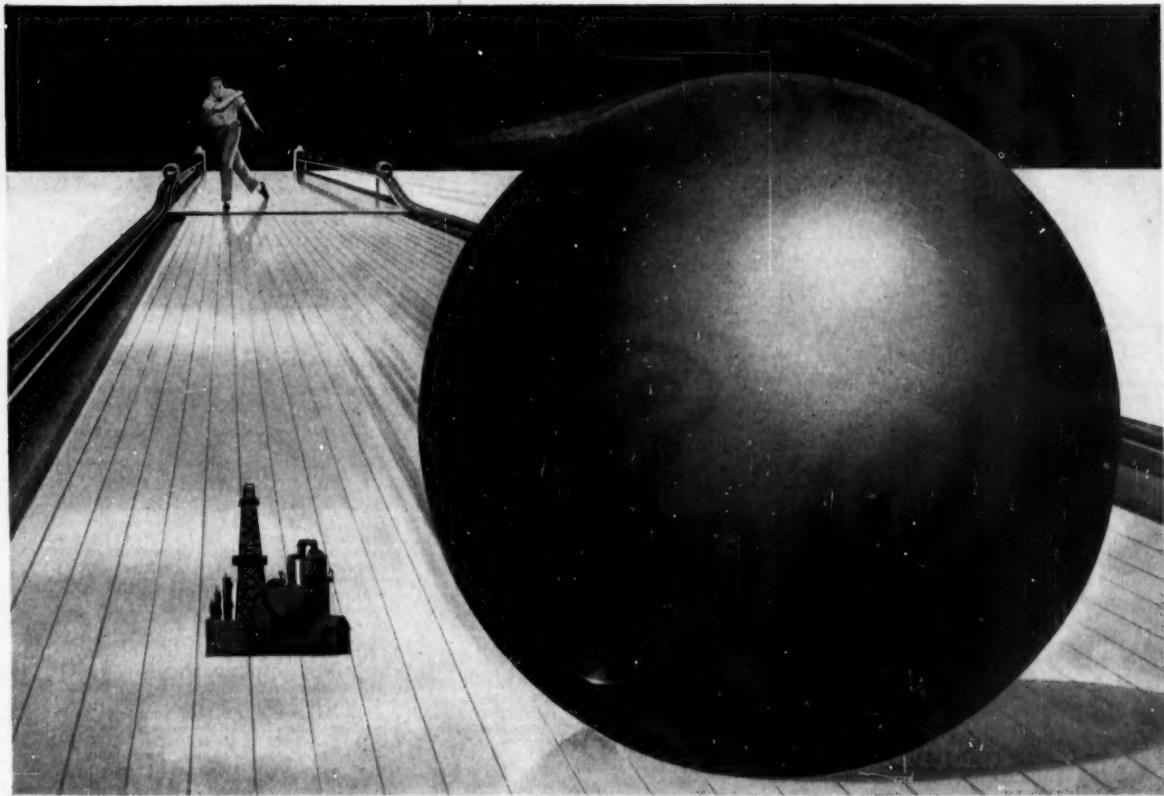
F. P. min. 120°C. Resin intermediate. Commercially available. Dow Chemical Co.

CYCLOPENTYL CHLORIDE

$\text{C}_5\text{H}_8\text{Cl}$ M.W. 104.58; B.P. 139-140°C; R.I. 1.4495; Sp. G. 1.0024. Reactive secondary chloride, recommended in reactions such as the Grignard reaction where yields are much greater than are attained with the bromide. Availability: Semi-commercial. Arapahoe Chemicals, Inc.

CYTIDINE

$\text{C}_9\text{H}_{13}\text{O}_5\text{N}_3$ M.W. 243.2; M.P. 230°C., spec. rot $\left[\text{n}_D^{25}\right]_D^{21} + 29.63^\circ$ (in water); very



BUSINESS PARTNER OF A BOWLING BALL

When a bowling ball slides neatly into the strike "pocket," more than marksmanship is involved. Alley finish must be smooth and rugged for high scores—and low maintenance.

Key to this kind of toughness is the superior resins produced through the use of the Olefins. These are members of Atlantic's petroleum chemical family—that's why you see the refinery in the picture.

Olefins are used in the production of quality resins for heavy-duty varnishes. You get faster drying, extra durability against wear and erosion. Typical applications include boats, industrial flooring, bowling alleys. Olefins are also being put to profitable use in the manufacture of rubber chemicals, germicides, insecticides, dyes and surface active agents.

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In Canada: Naugatuck Chemicals Division of
Dominion Rubber Company, Ltd.

In Europe: Atlantic Chemicals SAB,
Antwerp, Belgium

sol. in water; long crystalline needles. Chemical properties: dissociation constants: amino group, $pG'_1 = 4.22$, sugar, group, $pG'_2 = 12.3 - 12.5$; hydrolyzes to cytosine and D-ribose by heating with dil. sulfuric acid. When treated with nitrous acid it deaminizes with formation of uridine. Hydrolysis with bromide and hydrobromic acid gives bromouracil and D-ribonuc acid. Suggested uses: biochemical research. Schwarz Laboratories, Inc.

N-DECANE (OLEFIN FREE GRADE)

$C_{10}H_{22}$, M.W. 142.28; M.P., -27.7°C.; B.P., 174°C.; Sp. Gr., 20°/4°C., 0.7299; R.I., 1.4114 at 20°; Iodine Value, nil; Hydroxyl Value, nil; colorless liquid. Higher purity grade because of chemical treatment to remove unsaturates and oxygen-containing compounds. Suggested uses: Special solvent and chemical synthesis; calibration and standardization; still chaser; filler or thermo-elements. Humphrey-Wilkinson, Inc.

DECERESOL WETTING AGENT NI CONC.

A nonionic wetting agent of the alkylphenoxy-polyoxyethylene ethanol type. A clear, almost water-white liquid, dispersible in water, stable to acid and alkali. May be used in many textile processes such as acid or enzyme desizing, hydrogen peroxide and hypochlorite bleaching, dyeing or printing, carbonizing or wool, kiering, scouring, dye stripping, soaping off printed goods, finishing white goods and in resin baths as a penetrant. This product exhibits exceptional stability to salts, acids and alkalies and calcium soaps. It has especially high wetting power, even at very low concentrations. It is also useful as an emulsifying agent. Commercially available. American Cyanamid Co., Organic Chemicals Div., Textile Resins Dept.

DECERESOL WETTING AGENT P SPECIAL CONC.

A light amber, transparent, mobile liquid that is completely miscible with water. This product is an anionic surface active agent having dispersing, emulsifying and detergent properties in addition to good wetting power. It is stable and effective in hypochlorite and hydrogen peroxide bleaching operations as well as in alkaline baths. This product is very efficient in kiering and boiling off cotton greige goods, open width boil off of twills, and for scouring wool, nylon and other synthetics and blends. It is very efficient in emulsifying throwing oils and prevents their redeposition. Commercially available. American Cyanamid Co., Organic Chemicals Div., Textile Resins Dept.

DECYL ALCOHOL

$C_{10}H_{21}OH$; M.W. 158; Sp. Gr., 20/20°C., 0.837; boiling range 215-222°C. at 760 mm; water-white color; viscosity 21 c.s. at 20°C.; purity — 99%. Mixture of primary isomeric C_{10} alcohols (principally trimethylheptanols). Suggested uses: Manufacture of ester-type plasticizers; herbicides, synthetic lubricating oils, hydraulic fluids and textile lubricants. Available in tank car quantities. The Enjay Co.

DEFLUORINATED PHOSPHATE

A phosphate rock from which fluorine has been removed by high temperature calcination. Contains a minimum of 17% phosphorus and 34% calcium, with a maximum fluorine content of 0.17%. It is widely used as a mineral supplement in feeds for stock and poultry. Tests show that it is substantially 100% Biologically available. It is nonhygroscopic, non-acid and is soluble in neutral ammonium citrate, 2% citric acid, and 0.4% HCl acid. Commercially available. Coronet Phosphate Co., division of Smith-Douglas Co., Inc.

DEFOAMER PC-1244

Defoamer PC-1244 is an acid-stable defoaming agent. It is particularly effective in systems wherein the continuous phase is organic in nature and with a pH below 7. PC-1244 is

soluble in most common organic solvents and shows excellent lasting qualities. Defoamer PC-1244 is a straw colored to yellow liquid. It is currently supplied as a 40% solution in kerosene. The effective concentration varies from 5 to 5000 ppm. of active ingredient with an average use concentration of 250 ppm. Availability: commercial quantities. Monsanto Chemical Company, Organic Chemicals Division.

DETERGENT—ATLAS G-3000

Polyoxyethylene alkyl ether, 100% active, liquid nonionic detergent. Excellent stability to acids and alkalies, excellent wetting properties. Suggested uses: cotton and wool detergent, textile wetting and scouring applications, metal cleaning, etc. Commercially available. Atlas Powder Co.

DETERGENT—ATLAS G-3006

Polyoxyethylene alkyl ether, 100% active, liquid nonionic detergent. Excellent stability to acids and alkalies, excellent wetting properties, low foaming capacity. Suggested uses: automatic dishwashing machine detergent compounds, metal cleaning, etc. Commercially available. Atlas Powder Co.

DETERGENT—RENEX 25

A polyoxyethylene ester of mixed fatty and resin acids, combined with urea. Free flowing nonionic detergent powder, easily compounded with alkalies. Relatively low foaming. Suggested uses: cotton detergent for both hard and soft water, textile wetting and scouring operations, metal cleaning, liquid dishwashing detergent compounds etc. Commercially available. Atlas Powder Co.

DETERGENT—RENEX 30

Polyoxyethylene alkyl ether, 100% active, liquid nonionic detergent. Excellent stability to acids and alkalies, excellent wetting properties, relatively high foaming capacity for nonionic surfactant. Suggested uses: cotton and raw wool detergent, textile wetting and scouring applications, metal cleaning, liquid dishwashing detergent compounds etc. Commercially available. Atlas Powder Co.

DETERGENT—RENEX 35

Polyoxyethylene alkyl ether combined with urea. Free flowing powder easily compounded with alkalies. Excellent wetting properties, relatively high foaming capacity for a nonionic detergent. Suggested uses: cotton and raw wool detergent, textile wetting and scouring applications, metal cleaning, etc. Commercially available. Atlas Powder Co.

DIALLYL PHTHALATE DRY PREPOLYMER

Colorless, Iodine No. 60, softening range 65-95°C., Sp. Gr., 25°C./4°C., 1.240-1.260. Soluble in diallyl phthalate monomer, acetone, toluene, benzene, and other aromatic solvents. Insoluble in water. This prepolymer can be polymerized into a hard, clear, insoluble polymer with the aid of heat and a catalyst. Benzoyl Peroxide, t-Butyl Perbenzoate, t-Butyl Hydroperoxide and other peroxides are suggested catalysts. There is little or no shrinkage during polymerization. (In the polymerization of Diallyl Phthalate Monomer there is about 13% shrinkage.) Suggested uses: Electrical molded parts requiring peak performance at high frequency and high humidity, high quality laminates with glass, fiber, cotton, paper, nylon, etc., chemical proof coatings and molded parts either clear or filled, glass preform binder, etc. Availability: Commercial quantities available. Ohio-Apex Division, Food Machinery & Chemical Co.

DIAMOND CRYSTAL SALT WITH ANTI-OXIDANT

A new formulation designed to give superior rancidity protection with fewer color problems. Available in either Fine or Fine Flakes Prepared (tricalcium phosphate drier). Alberger Salt (99.95% screens). Antioxidant Composition: butylated hydroxyanisole 0.128%; propyl gallate 0.047; citric acid 0.028; propylene glycol 0.047; tricalcium phosphate 1.5. Protects fat content of nuts, potato chips, candy, peanut butter and other high fat, low moisture foods. Diamond Crystal Salt Co.

DIAMOND CRYSTAL SALT—RUST INHIBITOR ADDED

Granulated Salt containing sodium hexametaphosphate, a catalytic (negative) rust inhibitor, R.I.A. brine less corrosive than water. Used in brine refrigerating lines, as coal anti-freeze, ice plants and for boiler feed water softener regeneration. Diamond Crystal Salt Co.

DIAMIYLAMINE

$(C_6H_{11})_2NH$, M.W. 157.29; Sp. Gr., 0.77 at 20°/20°C.; Color, pale yellow; Amine Content, 98%; I.B.P., 180°C.; F.B.P., 205°C.; Flash Point (open cup), 150°F. Suggested uses: Intermediate for oil-soluble rubber and agricultural chemicals, pharmaceuticals, surface active agents, anti oxidants and dyes. Available in semi-commercial quantities from Sharples Chemicals Inc.

DIANISIDINE DIISOCYANATE

(3,3'-Dimethoxy-4,4'-biphenylene diisocyanate) $OCON(CH_3O)C_6H_4C_6H_5(OCH_3)NCO$, M.W. 296.28. Crystalline solid, M.P. 122°C. Soluble in benzene, toluene and chlorinated solvents. Decomposes in water, alcohols, and other active hydrogen solvents. Chemical properties: Readily undergoes reaction with compounds having labile hydrogen: water, alcohols, mercaptans, acids, amines, etc. Suggested uses: Manufacture of rigid and flexible foams, elastomers, resins, fibers, and adhesives. Modification of polyesters, drying oils, natural and synthetic fibers, paper and leather. Availability: Semi-commercial quantities. The Carwin Company.

DICAPRYL PHTHALATE ("ELASTEX"® 80-P PLASTICIZER)

$C_4H_9O_4$, M.W. 380.5; clear liquid; color (Hazen) 100 max; Sp. Gr., 0.970 min. General purpose plasticizer compatible with many synthetic resins and polymers. In vinyl resins it approximates DOP and DIOP in performance. Available in commercial quantities. Barrett Division, Allied Chemical & Dye Corp.

3. 4. DICHLOROANILINE

$C_2C_6H_4NH_2$, M.W. 162, White to light tan solid. Characteristic amine odor. Assay 97% min. Contains small traces 2,3- and 2,5-dichloro isomers. C.P. 70-71°C. Similar to aniline in stability, discolors in the presence of oxygen and light. Soluble in alcohol, ether, Si. Sol. in benzene. Insoluble in water. Availability: re-sale quantities. Monsanto Chemical Co., Organic Chemicals Div.

1, 4 DICHLOROBUTANE (DCB)

$Cl(CH_2)_3Cl$, M.W. 127.02; colorless mobile liquid with mild, pleasant odor; miscible with most organic solvents; practically insoluble in water; B.P., 155°C.; F.P., -37.3°C.; flash point (Tag closed up) 40°C.; weight per gallon 9.46 pounds. Use: chemical intermediate. Either or both of the highly reactive chlorine atoms can be replaced by a group such as thiol, cyanogen, amine, alkoxy, aryloxy. Available in commercial quantities. Electrochemicals Dept., E. I. duPont de Nemours & Co.

DICHLOROMONOFLUOROACETIC ACID

CCl_2FCOOH , M.W. 146.94. F.P., -20°C.; B.P., 163°C.; water white pungent liquid; completely miscible with water and many organic solvents. Chemical Properties: Strong acid; undergoes usual reactions associated with a carboxyl group. Suggested Uses: As a catalyst and chemical intermediate. Availability: Experimental quantities. Allied Chemical & Dye Corp., General Chemical Div.

2, 6-DICHLORO-4-NITROANILINE

$C_6H_4NH_2NO_2Cl_2$, M.W. 207; light yellow powder; min. purity 95%; melting point range 186-187°C. Suggested uses: in dyestuffs. Commercially available. Antara Chemicals, a Sales Division of General Aniline & Film Corp.

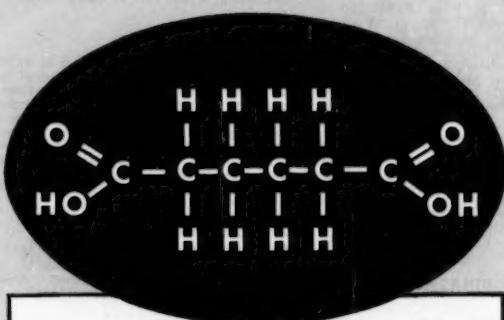
3-(4-DICHLOROPHENYL)-1, 1-DIMETHYLUREA

$C_9H_{10}NO_2Cl_2$, M.W. 233-02. Pure compound: M.P. 153-155°C Vap. Press. 2×10^5 mm. Hg. at 30°C. Very low solubility in common hydrocarbon solvents, in distilled water approx. 0.0042% at 24°C; color, white. Stable toward oxidation and moisture under conventional conditions. Commercially available formulations and uses: Du Pont "Telvar" DW weed killer (80% wettable powder) for general weed control on non-crop land; Du Pont "Karmex" DL herbicide (30% aqueous suspension) for pre-emergence weed control in cotton. E. I. duPont de Nemours & Co., Inc.

2, 6-DICHLORO-4-NITROANILINE

$C_6H_4NH_2NO_2Cl_2$, M.W. 207; light yellow powder; min. purity 95%; melting point range 186-187°C. Suggested uses: in dyestuffs. Commercially available. Antara Chemicals, a Sales Division of General Aniline & Film Corp.

Investigate . . . DU PONT ADIPIC ACID



White crystalline solid 99.60% min.

PHYSICAL PROPERTIES

Solubility—Soluble in Methanol, slightly soluble in water and cyclohexanone at room temperature.

pH of 3% solution—2.7 @ 25°C.

CHEMICAL PROPERTIES

Relatively Stable—can be held in molten state for long periods without decomposition . . . decomposes at temperatures approaching its boiling point. Is not oxidized by strong nitric acid at ordinary temperatures.

Reacts with Alcohols and basic materials in normal manner.

Corrosion Characteristics—Solid acid and aqueous solutions somewhat corrosive to mild steel. Can be handled by stainless steel under ordinary conditions.

A versatile dibasic acid with many applications in plastics, petroleum, chemical and allied fields

IN PLASTICS, Adipic Acid is used in the manufacture of monomeric and polymeric plasticizers for synthetic resins and as an intermediate for polyester laminating resins.

IN THE PETROLEUM INDUSTRY, Adipic Acid serves as an intermediate for esterlubes and lubricating oil additives.

IN CHEMICAL MANUFACTURE, Adipic Acid is used in the synthesis of salts, esters, amides, glycols and ketones. Other applications include the manufacture of adhesives and polyester rubber and cellulose stabilization.

Du Pont Adipic Acid is available in 50-lb. multi-ply paper bags. Prompt shipment can be made from strategically located stock points.

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Please send me more information on Du Pont Adipic Acid—specifications, chemical and physical properties, suggested uses, bibliography, etc. I am interested in evaluating Adipic Acid for the following applications:

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City _____ State _____

C W Report

DICHLOROTETRAFLUOROACETONE

$\text{CCl}_2\text{CO.CCl}_2$, M.W. 198.94; B.P. 44.2°C.; water white lachrymatory liquid; vapor pressure equation, $\log P_{\text{psia}} = 5.6886 - 1434.8/T^{\circ}\text{K}$; miscible in all proportions with water in which it dissolves exothermically, miscible with most organic solvents. Chemical Properties: Stable to acids but attacked by alkalies. Availability: Experimental quantities. Allied Chemical and Dyne Corp., General Chemical Div.

DICYCLAMINE 8 [DI-(METHYLCYCLOHEXYLMETHYL) AMINE (MIXED ISOMERS)]

$\text{C}_{14}\text{H}_{25}\text{NH}_2$, M.W. 237.4. Sp. G. 0.9366 at 20°/20°C.; B.P. 213°C. (50 mm. Hg); V.P. < 0.01 mm. Hg at 20°C.; Fr. P. acts to glass below -70°C., sol. in water, < 0.01% at 20°C.; sol. in water, 0.51% at 20°C.; Visc., 15.7 cps. at 20°C.; odor, mild, ammoniacal; yellow wax-like material. Chemical properties: Dicyclic sixteen carbon secondary amine. Enters into typical reactions of secondary amines. Suggested uses: Preparation of oil demulsifiers, corrosion inhibitors, surface-active agents, and rubber chemicals. Availability: research quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

DICYCLAMINE E8 [DI(2,5-ENDOMETHYLENECYCLOHEXYLMETHYL) AMINE]

$\text{C}_{14}\text{H}_{25}\text{NH}_2$, M.W. 231.4; Sp. G. 0.9587 at 60°/20°C.; B.P. 169°C. (10 mm. Hg); V.P. < 0.01 mm. Hg at 20°C.; Fr. P. 50°C.; sol. in water, < 0.01%; Visc., 11.3 cps. at 60°C.; odor, characteristic amine; yellow wax-like material. Chemical properties: Dicyclic sixteen carbon secondary amine. Enters into typical reactions of secondary amines. Suggested uses: Preparation of oil demulsifiers, corrosion inhibitors, surface-active agents, and rubber chemicals. Availability: research quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

DICYCLOHEXYL CARBINOL

$\text{C}_{12}\text{H}_{24}\text{O}$, M.W. 196; S.P. 58°, B.P. 135°C. (5 mm.); color, colorless solid. Chemical properties: Readily oxidized to dicyclohexyl ketone; transesterification yields dicyclohexylcarbinyl esters; halogen acids replace hydroxyl by halogen. Suggested uses: Synthesis of pharmaceuticals. Availability: Pilot-Plant quantities. The Trubek Laboratories.

DICYCLOHEXYLKETONE

$\text{C}_{12}\text{H}_{22}\text{O}$, M.W. 194, B.P. 120°C. (3mm), R.I. 1.484 at 20°C., S.P. 11°C., color, water white. Chemical Properties: Its carbonyl group gives the usual carbonyl reactions; the adjacent carbon atoms are active and may be readily substituted. Suggested uses: synthesis of pharmaceuticals and other organic chemicals. Availability: pilot-plant quantities. The Trubek Laboratories.

PENCO DIELDRIN E-1½

An emulsifiable concentrate of dieldrin (hexachloroepoxytetrachloroethane, exo-dimethanophenone). For use as an insect control spray. The product contains 1 1/2 lbs. dieldrin per gallon and is used at 1/2 to 3 pints diluted with 3 to 10 gallons of water per acre for the control of many harmful cotton insect pests. Penco Dieldrin E-1 1/2 is also very effective for armyworm and chinch bug control in corn and small grains and against certain insects attacking peaches and apples. There are also available various dust formulations of dieldrin in combination with DDT and sulphur under the Penco brand for cotton insect control. Commercially available. Pennsylvania Salt Mfg. Co. of Washington.

DIETHYL SULFIDE

$\text{C}_2\text{H}_5\text{SC}_2\text{H}_5$; Boiling range, 88.9 to 92.3°C.; purity 96.0; color, water white. Chemical properties: Oxidizes to sulfoxide and sulfane.

Forms addition products with a great variety of substances including mercuric salts, alkyl halides, benzyl chloride and benzyl alcohol. Reacts with bromocyanate to form ethyl thiocyanate and ethyl bromide. Availability: drum lots. Index Chemical Co.

DIETHYLBENZENE—(DOW ETCH GRADE)

B. R. at 760 mm. Hg, 5 to 95%, 180 to 182°C.; F. P., below -70°C.; Sp. gr. at 25/25, 0.868; R. I. at 25°C., 1.493; Flash point, 135°C.; Fire point, 145°C. Commercially available. Chemical intermediate. Solvent for cleaning magnesium printing plates. Dow Chemical Co.

DIHYDROPYRAN

$\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2=\text{CH}-\text{O}$ M.W. 84.114; colorless liquid; B.P. 86°C. (187°F.), flash point (Tag closed cup) approx. -18°C. (O.F.). Variety of compounds made through reaction of the double bond. Fission of the ring leads to alpha, omega-disubstituted derivatives. Available in semi-commercial quantities. Electrochemicals Department, E. I. duPont de Nemours & Co.

2,2-DIHYDROXY-6,6-DINAPHTHYL DISULFIDE

$\text{C}_{20}\text{H}_{14}\text{O}_2\text{S}_2$ • M.W. 350.4; M.P. 220-223°C. (uncorr.). Suggested uses: biochemical and medical research. Specific sulphydryl reagent. Schwarz Laboratories, Inc.

BAKER'S ® DIHYDROXY STEARIC ACID

Dihydroxy Stearic Acid, M.W. 314, tan, waxy solid; odor, Gardner (melted) 10; volatile matter, 0.8%; melting point, 80-83°C; acid value, 168; iodine value, 3; sap. value, 182; hydroxyl value, 257. Insoluble in water; soluble in most organic solvents. Availability: Pilot Plant, The Baker Castor Oil Co., Commercial Development Div.

3,5-DIHDOSALICYLIC ACID

$\text{C}_7\text{H}_6\text{O}_3\text{I}_2$; MW. 389.9; iodine assay 63-65%; physical form: fine crystalline powder, white to pale pink; solubility in water: 1 part in 6000 at 25°C; solubility in saturated sodium chloride brine: less than 1 part in 10,000 at 25°C; purity: 97% minimum. Stable to air oxidation and iodine loss at temperatures up to 100°C for extended periods. A convenient organic source of iodine for incorporation in salt blocks and trace mineralized salt for animal nutrition. Commercially available. Ringwood Chemical Corp.

p,p-DIMETHOXYBENZOPHENONE

$\text{C}_11\text{H}_{14}\text{O}_3$, M.W. 242; M.P. 145°. Chemical Properties: the carbonyl group may be reduced to carbinal or replaced by carbaminone. Substituents such as nitro or halogen may be introduced ortho to the methoxyl groups. Suggested uses: synthesis of pharmaceuticals and other organic chemicals. Availability: pilot-plant quantities. The Trubek Laboratories.

3-DIMETHYLAMINOPROPYLAMINE

$(\text{CH}_3)_2\text{N}(\text{CH}_2)_3\text{NH}_3$, M.W. 102.18; Sp.G. 0.8100 at 30°C.; R.I. 1.4328 at 25°C.; B.P. 134°C.; colorless liquid; miscible with water and most organic solvents. Will take part in reactions common to primary and tertiary amines. Potential uses: curing agent for epoxy resins, useful as a chemical intermediate and in the synthesis of textile assistants, dispersing and emulsifying agents. Available in semi-commercial quantities. American Cyanamid Co.

DIMETHYL CARBATE

Bicyclo (2.2.1)-5-Heptene-2,3-Dicarboxylic Acid Dimethyl Esters, $\text{C}_7\text{H}_{14}\text{O}_4$, M.W. 210; Sp.G. 1.165 at 35°/4°C. Clear, oily liquid or crystalline solid. Setting point 35°C. Insoluble in water. Suggested use: Insect repellent. Availability: commercial quantities. Chemo Puro Mfg. Corp.

DIMETHYL HYDANTOIN

$(\text{CH}_3)_2\text{C}-\text{NH}-\text{CO}-\text{NH}-\text{CO}$, M.W. 128.13; white, crystalline solid; M.P., 178°C. (352.4°F.). Soluble in water, ethanol, diethyl ether, and ethyl acetate. Reacts by substitution in the imino and carbonyl groups. Mineral acids and dilute alkalies split the ring. Available in commercial quantities. Electrochemicals Dept., E. I. duPont de Nemours & Co.

DIMETHYL HYDANTOIN-FORMALDEHYDE RESIN (DMHF)

Light colored brittle resin; average molecular weight 240-300; initial softening point 60°C. (140°F.); density g./ml. 1.30. Dissolves readily in cold and hot water, methanol, ethyl acetate, methyl ethyl ketone, chloroform, methylene chloride, and hot glycerol. Insoluble in benzene, xylene, petroleum ether, diethyl ether, trichlorethylene, and carbon tetrachloride. Com-

patible in water solution with starch, dextrin, casein, glue, zein, "Elvanol" polyvinyl alcohol, poly-methacrylic acid, and sodium carboxymethyl cellulose. Suggested uses: textile sizing, paper sizing and coating, as a modifying agent for starch and protein adhesives, and as a blending agent for aqueous solutions of gums and resins. Available in commercial quantities. Electrochemicals Dept., E. I. duPont de Nemours & Co.

DIMETHYL SULFIDE

CH_3SCH_3 . Boiling range, 35.5 to 37.8°C; purity, 98.0; color, water white. Chemical properties: oxidizes to the sulfoxide and sulfane. Can be reduced to methyl mercaptan. Forms addition products with a great many substances including mercuric salts and alkyl halides to form R_2HgX_2 , $\text{R}_2\text{Sv}_2\text{X}_2$ and R_2SX . Reacts with bromocyanate to form methyl thiocyanate and methyl chloride. Can be chlorinated to form $\text{C}_2\text{H}_5\text{CSCH}_2\text{Cl}_2$. Availability: Drum lots. Index Chemical Co.

DIMETHYLSULFIDE

CH_3SCH_3 , M.W. 50.1; I.B.P., 36°C.; F.B.P. 39.1°C.; Sp.G. 0.87 at 20°/20°C. Suggested application: organic synthesis. Available in commercial quantities from Sharples Chemicals Inc.

2,6-DINITROPHENOL

$\text{C}_6\text{H}_3\text{NO}_2\text{O}_5$, M.W. 184; yellow crystals; M.P. 104°-108°C. Sl. Sol. Water. Sol. organic solvents and alkalies. Uses: manufacture of dyestuffs and organic chemicals. As an indicator over pH range 4-5.4. Availability: experimental quantities. Eastern Chemical Corp.

2,6-DINITROPHENOL

$\text{C}_6\text{H}_3\text{NO}_2\text{O}_5$, M.W. 184; yellow crystals; M.P. 63-64°C. Sl. sol. Water. Sol. most organic solvents and alkalies. Uses: manufacture of dyestuffs and organic chemicals, as an indicator over pH range 2-4. Availability: experimental quantities. Eastern Chemical Corp.

DINOPOL IDO (ISO-DECYL OCTYL PHthalate)

S.P. G. at 20°C., 0.975; Mid-boiling point at 4 mm., 242°C.; R.I. at 25°C., 1.483; viscosity at 20°C., 90 cps.; light colored oil-liquid. Suggested uses: primary plasticizer for vinyls and other resins with low volatility and other desirable properties. Availability: any quantity. Ohio-Apex Division, Food Machinery and Chemical Corp.

DIPHENIC ACID

$\text{C}_14\text{H}_{10}\text{O}_4$, M.W. 242.22; M.P., 228-229. White needles, soluble in hot water. Uses: organic syntheses, and in the preparation of pharmaceuticals. Availability: commercial. Heifetz and Co.

DIPHENYLACETONE (UNSMY)

$\text{C}_{15}\text{H}_{14}\text{O}$, M.W. 210; M.P., 59.5°-60.5°, colorless crystals. Chemical properties: its carbonyl group, given the usual carbonyl reaction; the adjacent methyl group undergoes substitution and condensation. Suggested uses: synthesis of pharmaceuticals and other organic chemicals. Availability: pilot plant quantities. The Trubek Laboratories.

DIPHENYL BUTADIENE

$\text{C}_{14}\text{H}_{14}$, M.W., 206.27; M.P., 70-71; white leaflets, soluble in ether and benzene, slightly soluble in alcohol. Uses: organic syntheses, radioactive instruments, detection. Availability: pilot plant. Heifetz and Co.

N-DODECANE (OLEFIN FREE GRADE)

$\text{C}_{12}\text{H}_{24}\text{N}_2$; M.P., 170-33; M.P., -9.6°C.; B.P., 216.3°C.; Sp.G., 20°/4°C., 0.7488; R.I., 1.4216 at 20°C.; iodine value, nil; hydroxyl value, nil; colorless liquid. Higher purity grade because of chemical treatment to remove unsaturates and oxygen-containing compounds. Suggested uses: special solvent and chemical synthesis; calibration and standardization; still chaser; filler for thermo-elements. Humphrey-Wilkinson, Inc.

DODECENYL SUCCINIC ACID

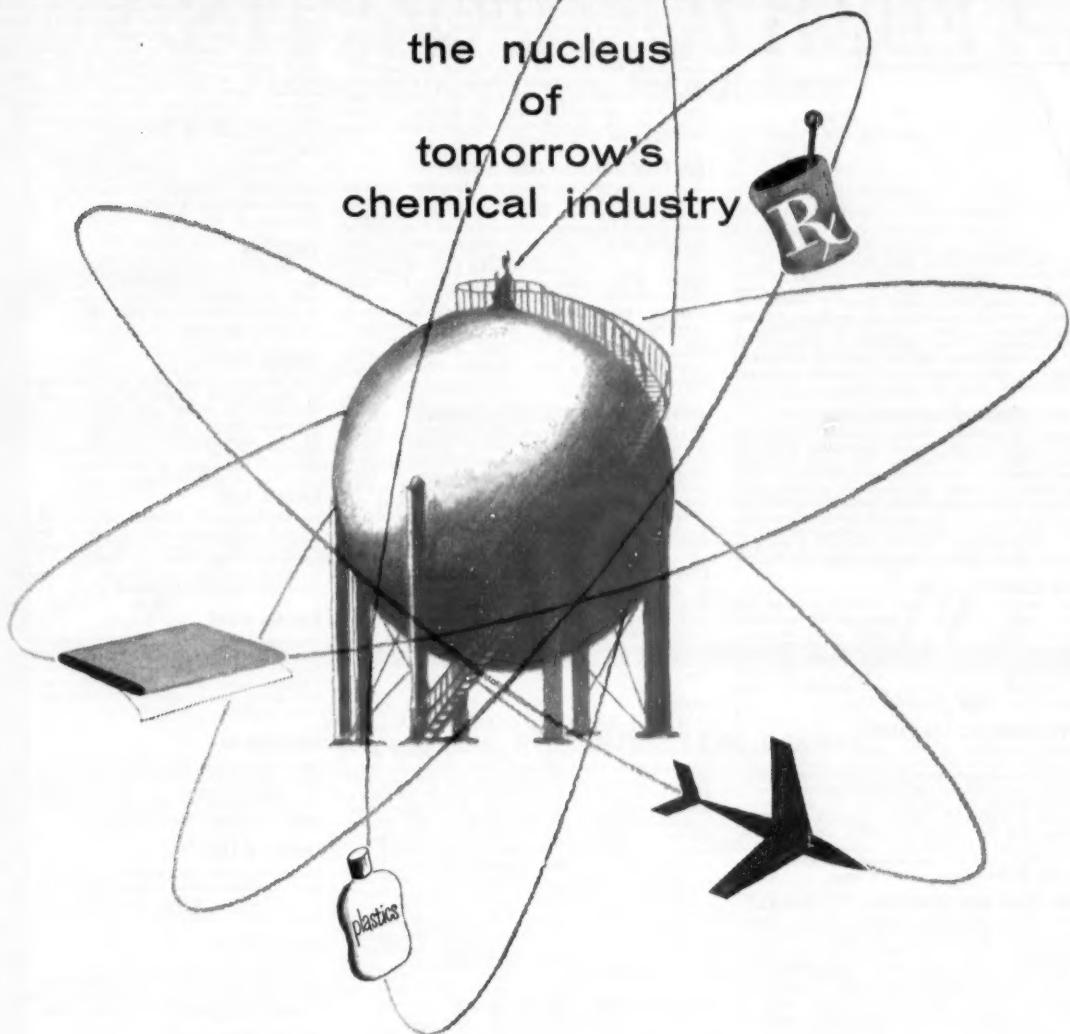
$\text{HOOCCH}(\text{C}_1\text{H}_2\text{C}_2)\text{CH}_2\text{COOH}$, M.W. 284.28; an extremely viscous liquid. Neutral Equivalent, 142.52. Completely soluble in oil, practically insoluble in water. Chemical properties: forms esters and salts. Displays surface activity. Suggested uses: corrosion inhibitor in oils. Intermediate for making surfactants, also metallic soaps for use as vinyl stabilizers, fungicides, and in making greases. Waterproofing of hydroxyl or amino-bearing material such as cellulose, cotton or leather. A dibasic acid for making specialty resins. Availability: commercial. Humphrey-Wilkinson, Inc.

DOW CORNING 20

An excellent silicone release agent for epoxy,

PETROCHEMICALS

the nucleus
of
tomorrow's
chemical industry



1954

Many have predicted that by 1975 there will be 54 billion pounds of petrochemicals produced yearly—360 percent over the 1950 figure. And it is agreed that this poundage will represent better than 50 percent of the total chemical production. In fact, petrochemicals will form the nucleus of our future chemical industry.

National Petro-Chemicals Corporation's integrated operation at Tuscola, Illinois can help you

to participate in the expansion. The Petro plant takes natural gas from the pipe line and upgrades it into valuable raw materials such as ethylene, propane and butane, into important intermediates such as ethyl alcohol and ethyl chloride, and into polyethylene. This plant can be part of your production facilities.

We will be happy to speak with you about long term contract arrangements.

NATIONAL PETRO-CHEMICALS

C O R P O R A T I O N

A joint enterprise of National Distillers Products Corporation and Panhandle Eastern Pipeline Company
99 PARK AVENUE, NEW YORK 16, N. Y.

C W Report

phenolic, methacrylate and polyester resins. It produces a heat-stable, noncarbonizing, parting film that provides a clear, easy break between the mold and parts made from a variety of organic molding materials as well as silicone resin laminates. Dow Corning 20 Emulsion, a 25% silicone in water emulsion, is designed for use where a lower concentration of solvent is desired or where the use of water as a diluent is preferred. Dow Corning Corp.

DOW CORNING 105 EMULSION

Imparts a durable water repellent finish to either synthetic or wooden materials. Materials treated with Dow Corning 105 have increased water repellency and wrinkle resistance. They also show increased resistance to abrasion and to water borne stains, and have improved tear strength. Cleaning is easier; most fabrics finished with Dow Corning 105 Emulsion can be spot cleaned with solvent without leaving a tell-tale ring. Dow Corning Corp.

DOW CORNING F-121

Cures to form a resilient "adhesive" film on textile cans or rolls. It reduces the adhesion and minimizes build-up of such sizing or coating materials as starch, gelatin, synthetic rubber latices and styrenated resins. Dow Corning F-121 is easily sprayed or brushed on the cans or rolls and cures by drying overnight at room temperature. Dow Corning Corp.

DOW CORNING 555 FLUID

A water repellent silicone that is characterized by a high degree of compatibility with organic materials such as beeswax, lanolin and alcohol. Because it provides protection against water borne irritants, yet does not feel oily and allows the skin to "breathe." Dow Corning 555 Fluid is suggested for use in protective hand creams, dermatological preparations and lotions that are applied before swimming, laundering or washing dishes. Dow Corning Corp.

DOW CORNING 55 PNEUMATIC GREASE

A heat-stable, oxidation resistant, silicone based grease designed primarily for dynamic lubrication between rubber and metal parts in aircraft pneumatic systems. The outstanding properties of this lubricant suggest its use on O-rings and seals for industrial applications and as an oxidation resistant grease for certain bearing metals. It meets the requirements of Specification MIL-L-4343A. Dow Corning Corp.

DOW CORNING 2105 RESIN

A new Class H laminating resin with improved physical and electrical properties. At 250°C the dielectric life of the best silicone-glass laminates previously available. It is recommended as a bonding agent for electrical laminates that must retain good dielectric properties at high temperatures such as transformer tubes, and barrier and terminal strips. Dow Corning Corp.

DOW CORNING 2106 RESIN

A newly developed low pressure, silicone laminate which has increased physical strength and faster cure time. Typical 1/8 inch low pressure laminates, made with 181 glass cloth bonded with 2106 Resin, have a flexural strength of 50,000 psi at room temperature. Flexural strength at 500°F is 12,000 to 15,000 psi for laminates cured 6-12 hours at 480°F; 14,000 to 18,000 psi when cured 24 hours; and 18,000 to 20,000 psi when cured 48 hours. The same type of laminate has a tensile strength of 40,000 psi at room temperature; 30,000 psi at 500°F. Dow Corning Corp.

DOWANOL 18 (DIETHYLENE GLYCOL) METHYL ETHER

$C_6H_{12}O_3$, M.W. 120.1; B.R. at 760 mm. Hg, 5 to 95% 190-196°C.; Sp.G. at 25/25°C., 1.016-1.024; R.I. at 25°C., 1.4244; Viscosity at 25°C., 3.67 cps.; Flash point, 210°F. Fire point 210°F.; Color APHA, 15; Acidity (as acetic acid), max., 0.01%; used as a brake fluid component or a solvent. Commercially available. Dow Chemical Corp.

DRI-FILM 88 SILICONE RESIN

A thin film of Dri-Film 88 will lengthen the life of various pieces of electrical apparatus by protecting them against the common ailments of humidity, corrosive chemical atmospheres and dust. Dri-Film 88 is a highly polymerized, air drying silicone resin supplied at 10 per cent silicone solids in a mixture of toluene and petroleum spirits that can be applied by dip, brush or spray. Commercially available. General Electric Co., Chemical Div.

DRI-FILM 103 SILICONE RESIN

A clear transparent silicone resin that imparts water repellency to above-grade structural masonry, prolongs the useful life of the masonry and reduces maintenance costs. Dri-Film 103 is supplied as a 70 per cent silicone resin in solvent 100 and can be diluted with petroleum spirits, Kauri Butanol 33 minimum. Water repellent action takes place, where the Dri-Film 103 is absorbed into the capillary pores of the masonry giving rise to an enormous siliconized area which is hydrophobic in nature. Commercially available, it can be applied by brush or spray after diluting to a silicone concentration from 2 to 5 per cent. General Electric Co., Chemical Div.

DUPLEX BONADUR RED Y 20-6450

A resinated Beta-oxy-naphthoic red. Sp.G. 1.69; wt./gal. 14.10; bulkling value 0.0709. Good color stability and bleed resistance. Suggested applications: Inks for carton, waxing or food wrapper; other, in inks requiring good transparency, low bronze, and oil and fat bleed resistance. Excellent for blending and shading. Commercially available, American Cyanamid Co., Pigments Div.

DUPLEX PARA TONER XD 20-2800

A soft texture resinated dark Parathianiline Red. Sp.G. 1.46; wt./gal. 12.18. Bulking value 0.082; Oil Abs. 45. Good color stability at low temp. baking. Suggested uses: In inks for letter press, poster, Rotogravure. Commercially available, American Cyanamid Co., Pigments Div.

DURENE

$(CH_3)_4C_6H_9$. Durene content, 99 Mol.%; M.W., 134; M.P., 79.1°C Durene or 1, 2, 4, 5-tetramethylbenzene is a white crystalline solid possessing unusual physical and chemical properties. The two open positions on the benzene ring are quite reactive and readily undergo aromatic substitution reactions. Since these two carbons are para to one another, they make durene a promising raw material for the manufacture of dyestuffs. The four methyl groups are also reactive and easily undergo oxidation, halogenation or other similar chemical reactions characteristic of aromatic side chains. Since many of the products made from durene are symmetrical in structure, they should impart exceptional properties when used in the manufacture of polymers. Availability: laboratory quantities for experimental investigation. Sinclair Chemicals, Inc.

DYE LEVELER—ATLAS G-1240

A waxy, nonionic, essentially 100% active material. Effective as a dye leveler when dyeing nylon with acetate dyes. M.P. 32-35°C.; Sp.G. 1.14; soluble in water, lower alcohols, acetone, chloroform and xylene. G-1240 is used at 0.15% to 0.50% on the weight of the goods being dyed and the pH of the dye bath should be between 6.0 and 6.5. Commercially available. Atlas Powder Co.

KEL-F ELASTOMER

A saturated fluorocarbon polymer which contains more than 50 per cent fluorine by weight. Available as either a white spongy gum or a water dispersion. KEL-F Elastomer in the vulcanized gum form has a specific gravity of 1.85 and a tensile strength of 300 to 600 p.s.i. with an elongation of 400 to 800 per cent. The durometer hardness of the gum is 45A to 50A. KEL-F Elastomer is readily soluble in ketones, esters and cyclic ethers, but insoluble in alcohols and aliphatic, aromatic and chlorinated hydrocarbons. This elastomer can be readily compounded, mixed, molded, and extruded, using standard rubber processing equipment. It may be vulcanized by organic peroxides, polyisocyanates, polyamines and isocyanate amine combinations. Fillers and conventional rubber additives may also be added to KEL-F Elastomer stocks to vary the physical properties. KEL-F Elastomer is also compatible with other rubbers. The applications immediately envisioned for KEL-F Elastomer include chemical and heat resistant hose, tubing, diaphragms, gaskets, "O" rings, seals, tank linings, acid resistant boots, gloves and protective clothing, paints and sealants. Availability: experimental quantities. M. W. Kellogg Co.

"ELVADEX" VINYL POLYMER

A vinyl acetate copolymer soluble in aqueous

alkali; films produced from ammonia solutions are insoluble in water since the ammonia evaporates as the film dries. Films cast from sodium carbonate solution are readily soluble in water. The resin is soluble in low cost organic solvents such as methyl ethyl ketone, methanol, benzene and ethyl acetate; films produced from these solvents are water resistant. "Elvadex" vinyl polymer is supplied as clear, colorless beads which are free flowing and nonblocking. Uses: off-loom finish for dope-dyed acetate yarn; size for "Dacron" polyester fiber, and other synthetic yarns; lacquers, wax emulsions and water-based inks. Available in commercial quantities. Electrochemicals Department, E. I. duPont de Nemours & Co.

EMCO 64

A high melting alkyl amide; cream color; M.P. 92 deg. C. Intended as base for preparation of cosmetic creams, especially for anti-perspirant sticks and the like. Commercially available. Emulsol Corp.

EMCOL 4300

The ammonium salt of a sulfated monoglyceride. A clear liquid, soluble in water and possesses excellent foaming and detergent properties. Contains about 5 per cent solids of which about 13 per cent is inorganic salts. Intended primarily for use in shampoo formulations. Commercially available. Emulsol Corp.

EMCOL E-11

A 50 per cent solution of an alkyl benzyl triethyl ammonium chloride. It is furnished as a clear straw colored solution. Suggested uses: germicide, ingredient in detergent sanitizing formulations and as emulsifying agent. Commercially available. Emulsol Corp.

EMCOL H-837

New emulsifier for agricultural pesticide formulations. Modified anionic-nonionic blend, will produce emulsifiable toxaphene concentrates of superior aging qualities. Suitable for chlordane and many cotton spray formulations. Commercially available. Emulsol Corp.

EMCOL H-88

Emulsifier for agricultural pesticide formulations, anionic-nonionic blend. Specially designed for toxicants such as DDT, Aldrin, Hepta Chlor, Dieldrin in aromatic solvents. Commercially available. Emulsol Corp.

EMCOL H-140

Emulsifier for agricultural pesticide formulations. Anionic-nonionic blend. Specially designed for 5 lb per gallon malathion formulations. Commercially available. Emulsol Corp.

EMCOL H-141

Emulsifier for agricultural pesticide formulations. Anionic-nonionic blend. Specially designed for 8 lb per gallon malathion formulations. Commercially available. Emulsol Corp.

EMCOL (LM)

A methyl ester of animal fatty acids; acid value less than 2, iodine value less than 75, ASTM color less than 2. Recommended as lubricant in metal processing operations. Commercially available. Emulsol Corp.

EMULSIFIER—ATLAS G-3300

A liquid, salt-free alkyl aryl sulphonate, 90% active ingredient exhibiting light color, mild odor and excellent solubility and emulsifying properties. Suggested as an emulsifier for agricultural chemicals, mineral oils and solvents, either alone or in combination with non-ionic surfactants. Commercially available. Atlas Powder Co.

EMULSIFIER—ATLAS G-3335

A low viscosity liquid emulsifier consisting of a balanced blend of non-ionic and anionic emulsifiers. Especially designed for emulsification of agricultural chemicals, and exhibiting outstanding emulsifying action in soft or hard water at low levels of surfactant. When used alone or in combination with non-ionic emulsifiers produces emulsifiable concentrates that exhibit excellent spontaneity of emulsification outstanding emulsion stability, and superior shelf life. Commercially available. Atlas Powder Co.

G-E 11546: EPOXY-GLASS LAMINATE

Textolite 11546, epoxy-glass cloth laminate, is characterized by low moisture absorption, high insulation resistance, and high mechanical strength. It is ideally suited for electronic applications and for high strength requirements. Bonding strength is highest of the glass base laminates. The insulation resistance with respect

PICCO

PICCOUMARON

Para-Coumarone-Indene Resins

CHEMICAL PROPERTIES — Piccoumaron Resins have good acid resistance, being inert to all except strong concentrated oxidizing acids and they have good alkali and salt resistance. Acid number is approximately zero; they do not react with most pigments.

PHYSICAL PROPERTIES — Piccoumaron Resins vary from liquids through viscous liquids, and tacky solids to high melting point brittle solids. Colors vary from a deep reddish brown to pale yellow. The resins are thermoplastic and do not become infusible on heating. Weights average 8.5 to 9.2 lbs. per gallon.

SOLUBILITY — In coal tar solvents, turpentine and terpene solvents, and in most ketones all grades

are soluble. Most grades are soluble in most chlorinated solvents and derivatives and in esters; mainly insoluble in aliphatic alcohols and soluble in aromatic alcohols. They are largely soluble in drying and semi-drying oils.

COMPATIBILITIES — Most of the Piccoumaron Resins are compatible with most of the natural resins and all are compatible with oil-soluble phenolic type resins, and chlorinated diphenyl types of resins. They can be blended with long oil alkyds of certain grades. They are compatible with petroleum residues, coal tar residues, pitches resulting from oil refining and pine tar. The resins are mainly compatible with paint and varnish oils and with various types of

rubber and rubber-like materials.

Considerable use has been made of combinations of Piccoumaron Resins with chlorinated materials where non-inflammable and flame-resistant coatings are desired.

PLASTICIZERS — Most of the chemical or ester types and aromatic hydrocarbon types of plasticizers are suitable for Piccoumaron Resins. Most heat bodied oils are likewise good plasticizers for Piccoumaron Resins. Soft petroleum residues and cottonseed pitches and the like blend well with the resins.

STANDARD SOLUTIONS — Certain grades normally used in solution are offered in tank car or returnable drum quantities.

NUMBERING SCHEDULE PICCOUMARON RESINS

COLOR	Light 1½-3½	Medium 4-6	Reddish 6-9	Dark 9-12	Extra Dark 12-16	Extra Dark 12-16
MELTING POINT	Liquid Resin	459	429	449	469	439
	10°C—15°C	458	428	448	468	438
	30°C—35°C	457	427	447	467	437
	40°C—45°C	456	426	446	466	436
	50°C—55°C	455	425	445	465	435
	65°C—70°C	453	423	443	463	433
	80°C—90°C	452	422	442	462	432
	95°C—105°C	450	420	440	460	430
	110°C—120°C	450H	420H	440H	460H	430H
	120°C plus	450EH	420EH	440EH	460EH	430EH

SPECIAL GRADES — Special grades of Piccoumaron Resins can be made when required. The colors shown are on the Coal Tar Resin Color Scale. The melting points are by the ball and ring method.



**PENNSYLVANIA
INDUSTRIAL CHEMICAL CORP.**

CLAIRTON, PENNSYLVANIA

Plants at: Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.

District Sales Offices
New York, Chicago, Philadelphia, Pittsburgh

WRITE for technical bulletin giving complete information on Piccoumaron and samples for examination and testing. If you will describe application, we will be glad to recommend suitable grade.

Pennsylvania Industrial Chemical Corp.

Clairton, Pennsylvania

Please send bulletin and samples of Piccoumaron for (application) _____

Name _____ Position _____

Company _____

Address _____

(CW)

C W Report

Offered in development quantities. American Cyanamid Co.

ETHYLEDIAMINE DIHYDROBROMIDE

High melting white crystalline solid. Assay, min. 95% based on halogen content. Soluble in water. Laboratory production. Dow Chemical Co.

N-2-ETHYLHEXYL ANILINE

$C_6H_5NHCH_2CH(C_6H_5)C_6H_5$, M.W., 205.33; Sp. G., 0.9119 at 20°/20°C.; B.P., 194°C. (50 mm.); V.P., <0.01 mm. Hg at 20°C.; F.P., sets to glass below -70°C.; sol. in water, <0.01% at 20°C.; sol. water in, 0.1% at 20°C.; Visc., 7.4 cps. at 20°C.; odor, mild; color, light yellow. Chemical properties: Undergoes most reactions typical of secondary aryl and alkyl amines, mildly alkaline. Suggested uses: As solvent and acid acceptor; preparation of derivatives that show better hydrocarbon solubility and lower volatility than similar derivatives of the lower alkyl anilines; these derivatives should be useful as dyestuffs, pigments, corrosion inhibitors, oil additives, pesticides, and rubber and textile chemicals. Availability: commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

N-2-ETHYLHEXYL CYCLOHEXYLAMINE

$C_6H_5NHCH_2CH(C_6H_5)CH_2NHC_6H_5$, M.W., 211.38; Sp. G., 0.8488 at 20°/20°C.; B.P., 270.3°C. (760 mm.); V.P., <0.01 mm. Hg at 20°C.; F.P., sets to glass below -90°C.; Visc., 4.9 cps. at 20°C.; sol. in water, <0.01% at 20°C.; sol. water in, 0.4% at 20°C.; completely soluble in acetone, benzene, ethyl ether, heptane, methanol, and carbon tetrachloride; odor, mild, ammoniacal; color, water white. Chemical properties: Undergoes usual reactions of secondary amines. Suggested uses: Extractant for acidic materials; acid acceptor; alkaline organic solvent; intermediate for pharmaceuticals, rubber chemicals, and corrosion inhibitors. Availability: development quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

ETHYL MERCAPTAN

Synthetic ethyl mercaptan, C_2H_5SH ; Boiling range, 33.9 to 36.1°C; purity, 98.0%; color, water white. Chemical properties: Has many reactions analogous to the alcohols. Adds to a double bond to form thioether. Base material for synthesis of insecticides. Reacts with ethylene oxide to form ethyl thioethanol. Availability: Tank car quantities. Index Chemical Co.

ETHYL-3-OXO-6-HEPTENOATE

$CH_3CH_2CH_2COCH_2COOC_2H_5$, M.W. 170.2; Minimum purity, 95%; Sp. G. 0.980 to 0.990 at 25/25°C.; R.I. 1.4410 to 1.4490 at 20°C. Availability: Experimental quantities immediately available; larger supplies readily arranged. New York Quinine and Chemical Works.

ETHYL 5-OXO-1-PHENYL-2-PYRAZOLINE-3-CARBOXYLATE (PHENYLCARBETHOXYPYRAZOLONE)

$C_6H_5COHNHC_6H_4SO_3H$, M.W. 232; purity on wet basis: min. 50%. Light tan crystals. Suggested use: Dyestuff intermediate. Commercially available. Antara Chemicals, a Sales Division of General Aniline & Film Corp.

N-ETHYL-5-SULFOANTHRANILIC ACID (2-ETHYLAMINO-5-SULFOBENZOIC ACID)

$C_6H_5COOHNC_2H_5COOC_2H_5$, M.W. 245; light tan paste; assay on dry basis: min. 65.0%; by diazo, solids total chlorine content; total chlorine on dry basis: max. 0.50%, by combustion. Uses: Versatile intermediate. Commercially available. Antara Chemicals, a Sales Division of General Aniline & Film Corp.

ETHYL VINYL KETONE (INHIBITED WITH HYDROQUINONE)

$C_6H_5COCH_2CH_2$. Synonym: 1-pentene-3-one. M.W. 84.11; Fr. P. 102°C. A highly reactive olefinic ketone which polymerizes readily and reacts with the usual reagents which attack olefins and ketones. Suggested uses: polymerizes readily but may have greater utility as an intermediate for pharmaceutical use. Availability: Laboratory scale. Arapahoe Chemicals, Inc.

EURCYL ALCOHOL—"ADOL 22"

Typical Specifications: Unsaturated Monohydric Alcohol. Approx. 85% C_{22} chain length. M.W. 312; Cloud Point, 81°F.; I.V., 32; Sap. Val. 1.0; Fire Point, 433°F.; Viscosity, SSU/210°F. 43. Suggested Uses: Lubricants, Surfactants, Chemical Intermediates and Chemical Synthesis. Availability: Experimental quantities from pilot plant production. Commercial quantities available early 1954. Archer-Daniels-Midland Co.

FERRITIN, CADMIUM SALT

Naturally occurring iron bearing amino acid complex, containing 20-23% trivalent iron. It is identical with VDM, the hepatic vasodilator. It contains histidine, arginine, lysine, glycine, phenylalanine, tyrosine, cysteine, methionine, sul-

fur, phosphorus, and iron. Red crystals, soluble in water. Uses: Iron transport. Regulation of peripheral resorption of water, of interest in relation to antidiuretics observed in hepatic cirrhosis. Atomic radiation studies. Storage of iron readily available for hemin synthesis. Protection of the cell from toxic accumulation of ferric hydroxide. Treatment of hypochromic anemia. Available: commercial quantities. Heifitz and Co.

"FLEXOL" PLASTICIZER 77-G-DIPROPYLENE GLYCOL DIBENZOATE

M.W., 342.38; Sp. G., 1.1271 at 20°/20°C.; B.P., 250°C. (10 mm.); V.P., <0.01 mm. Hg at 20°C.; Visc., 227 cps. at 20°C.; F.P., sets to glass below -45°C.; R.I., 1.1530 at 20°C.; insoluble in water; liquid with bland odor. "Flexol" Plasticizer 77-G is a plasticizer for most types of synthetic resins though its chief uses are in the vinyl chloride plastic field. It is outstanding for its high solvent power for resins and its resistance to extraction by gasoline and mineral oil. Vinyl flooring products, hydrocarbon resistant plastics, and vinyl acetate emulsion paints are expected to be the chief outlets for 77-G. Availability: commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

"FLEXOL" PLASTICIZER 810

A mixed phthalate ester of higher alcohols. Sp. G., 0.9712 at 20°/20°C.; B.P., 245°C. (5 mm.); V.P., <0.01 mm. Hg at 20°C.; Visc., 101 cps. at 20°C.; F.P., sets to glass below -80°C.; R.I., 1.4851 at 20°C.; insoluble in water; light-colored liquid with slight odor. "Flexol" Plasticizer 810 is a primary plasticizer for vinyl chloride resins. It imparts improved low temperature properties, reduced volatility, and excellent electrical characteristics to vinyl resin compounds. "Flexol" 810 is resistant to water extraction and is suitable for all vinyl plastic products. Availability: commercial quantities. Carbide and Carbon Chemical Co., a Division of Union Carbide and Carbon Corp.

"FLEXOL" PLASTICIZER 812

A mixed phthalate ester of higher alcohols. Sp. G., 0.9711 at 20°/20°C.; B.P., 245°C. (5 mm.); V.P., <0.01 mm. Hg at 20°C.; Visc., 94 cps. at 20°C.; F.P., sets to glass below -80°C.; R.I., 1.4848 at 20°C.; insoluble in water; light-colored liquid; slight odor. "Flexol" Plasticizer 812 is a primary plasticizer for vinyl chloride resins. It imparts low temperature flexibility, excellent electrical characteristics and water extraction resistance to vinyl plastics. "Flexol" 812 is suitable for use in all vinyl plastic products where low volatility plasticizers are required. Availability: commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

FLEXICRIN® 15

Ethylene Glycol Monoricinoleate. M.W., 342. Clear, moderately viscous liquid. Density @ 25°C., lb/gal, 8.06; Sp. Gr. @ 25°C./25°C., 0.969. Ref. Index @ 25°C., 1.4740; Color, Gardner, 2-2; Volatile Matter, %, 0.5; Pour Point, °F., -5. Flash Point, COC, °F., 465; Fire Point, COC, °F., 525; Viscosity, G. H. @ 25°C., 0; Viscosity, SUS @ 210°F., 69; Acid Value, 4; Iodine Value, 79; Sap. Value, 166; Hydroxyl Value, 285. Insoluble in water. Soluble in most organic solvents. Made in commercial volume but not yet regularly manufactured. The Baker Castor Oil Co.

FLEXICRIN® 18

Isobutyl Ricinoleate. M.W., 352. Clear, bright, low viscosity liquid. Density @ 25°C., lb/gal, 7.59; Sp. Gr. @ 25°C./25°C., 0.913; Ref. Index @ 25°C., 1.4608; Color, Gardner, 4+; Volatile Matter, %, 0.3; Pour Point, °F., -10; Flash Point, COC, °F., 425; Fire Point, COC, °F., 470; Viscosity, G. H. @ 25°C., A; Viscosity, SUS @ 210°F., 43; Acid Value, 2.5; Iodine Value, 76; Sap. Value, 159. Insoluble in water. Soluble in most organic solvents. Made in commercial volume but not yet regularly manufactured. The Baker Castor Oil Co.

PENNsalt FOSRINSE CP

A chromic-phosphoric acid-type rinsing agent used in the Fosbond Process to remove traces of unreacted phosphatizing compounds prior to organic finishing. Commercially available through Metal Processing Department, Pennsylvania Salt Mfg. Co.

PENNsalt FOSBOND 10

Phosphatizing solution for spray application of zinc phosphate coating on iron and steel. Produces a fine-grained uniform crystalline structure tightly adherent to the metal providing excellent paint-bonding base and underfilm corrosion resistance. Coating weights range from 100 to 400 mg. per square foot. A Fosbond 10 cycle can be used to produce zinc phosphate coatings meeting the requirements of U.S. Government Specifications JAN-C-490, Grade 1; 57-0-2C, Type 2, Class C; and PA-

to humidity is very stable; after 96 hours in 90% relative humidity at 35°C, it measures 300,000 megohms. Water absorption after 25 hours for 1/16" thick material is 0.17%. Dissipation factor at 1 megacycle after 24 hours in water is 0.018. Commercially available. General Electric Co. Chemical Div.

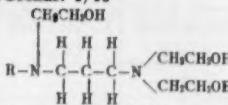
BAKER'S ESTANOX 203

Butyl Hydroxy-Acetoxy Stearate, M.W., 339. Clear, bright, low viscosity liquid. Density @ 25°C., lb/gal, 7.95; Sp. Gr. @ 25°C./25°C., 0.956. Ref. Index @ 25°C., 1.4588; Color, Gardner, 5-5; Volatile Matter, %, 0.4; Pour Point, °F., 35; Flash Point, COC, °F., 410; Fire Point, COC, °F., 460; Viscosity, G.H. @ 25°C., B; Viscosity, SUS @ 210°F., 44; Acid Value, 3.5; Iodine Value, 21; Sap. Value, 342. Insoluble in water. Soluble in most organic solvents. Made in commercial volume but not yet regularly manufactured. The Baker Castor Oil Co.

BAKER'S ESTANOX 206

Butil Polyacetoxy Stearate, M.W., 442. Clear, bright, low viscosity liquid. Density @ 25°C., lb/gal, 8.09; Sp. G. @ 25°C./25°C., 0.973. Ref. Index @ 25°C., 1.4532; Color, Gardner, 10; Volatile Matter, %, 0.4; Pour Point, °F., 35; Flash Point, COC, °F., 410; Fire Point, COC, °F., 460; Viscosity, G.H. @ 25°C., B; Viscosity, SUS @ 210°F., 44; Acid Value, 3.5; Iodine Value, 21; Sap. Value, 342. Insoluble in water. Soluble in most organic solvents. Made in commercial volume but not yet regularly manufactured. The Baker Castor Oil Co.

ETHODUCOMEEN T/13



N-octadecyl N, N', N'-tris-(2-hydroxyethyl) 1,3 trimethylene diamine. In this unique product are combined the strong cationic properties of the diamines with the water dispersibility of the ethoxylated compounds. Suggested uses: Emulsifier for specific systems; specialized corrosion inhibitor; acid salts. Availability: Limited quantities. Armour Chemical Div.

3,2-ETHYLUTOXY PROPIONIC ACID

$\text{CH}_3\text{CH}_2\text{CH}(\text{C}_2\text{H}_5)\text{CH}_2\text{OCH}_2\text{CH}_2\text{COOH}$, M.W., 174.23; Sp. G., 0.9690 at 20°/20°C.; B.P., 200°C. (100 mm.); V.P., <0.1 mm. Hg at 20°C.; F.P. sets to glass below -90°C.; sol. in water, <0.01% at 20°C.; sol. water in, 6.4% at 20°C.; color, water white. Chemical properties: Undergoes reactions typical of organic acids. Suggested uses: In preparation of metallic salts for use as paint driers and gelling agents. High-molecular-weight esters are of interest as detergents, emulsifiers, and plasticizers. Availability: commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

N-ETHYL CYCLOHEXYLAMINE

$C_6H_5\text{NHCH}_2\text{CH}(\text{C}_6H_5)\text{C}_6H_5$, M.W., 127.22; Sp. G., 0.8477 at 20°/20°C.; Fr. P., -43.6°C.; B.P., 164.9°C. (760 mm.); V.P., 1.8 mm. Hg at 20°C.; Visc., 1.5 cps. at 20°C.; sol. in water, 1.5% at 20°C.; sol. water in, 23% at 20°C.; completely soluble in acetone, benzene, ethyl ether, heptane, methanol, and carbon tetrachloride; odor, mild, ammoniacal; color, water white. Chemical properties: Undergoes usual reactions of secondary amines. Suggested uses: Alkaline organic solvent; extractant for acidic materials; acid acceptor; intermediate for pharmaceuticals, rubber chemicals, and corrosion inhibitors. Availability: development quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

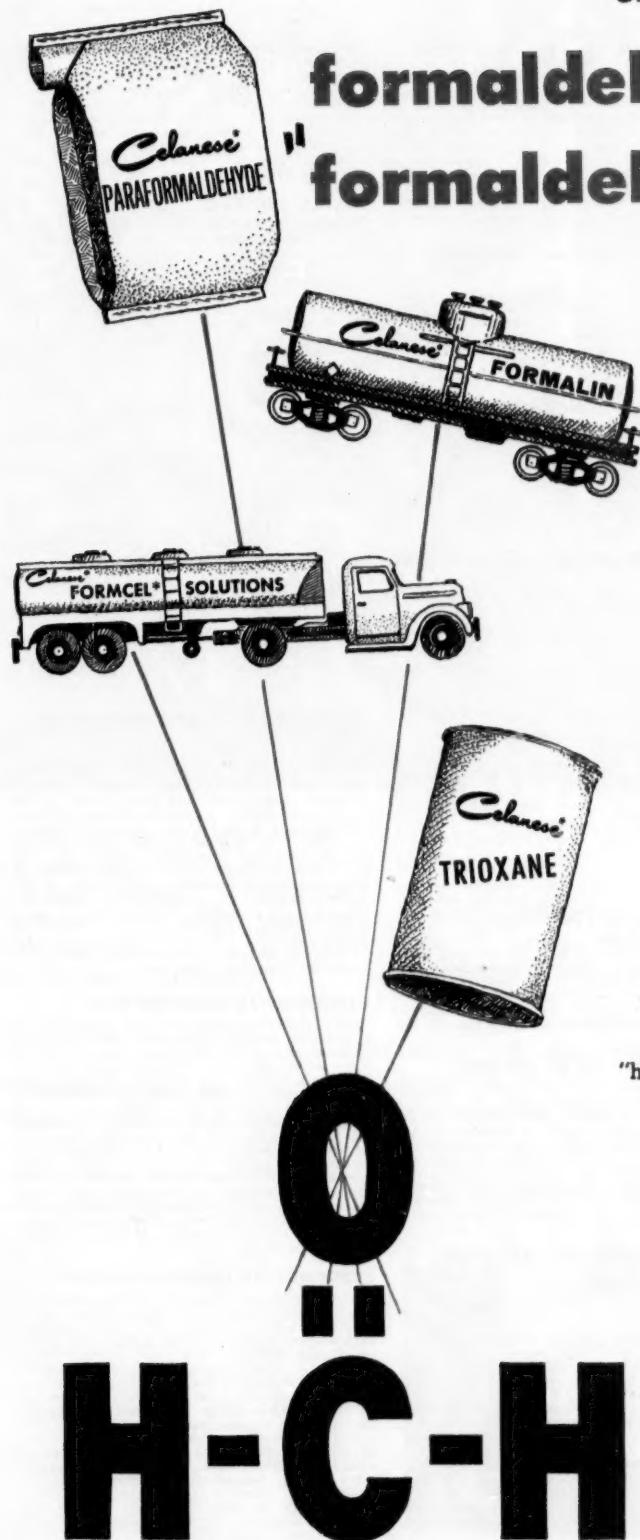
ETHYLENEBISOXYPROPYLAMINE

$[\text{CH}_2\text{O}(\text{CH}_2)_2\text{NH}]_2$, M.W., 176.26; Sp. G., 0.974 at 30°C.; R.I., 1.4596 at 25°C.; B.P., 140°C. (10 mm.); colorless liquid; miscible with water and the common organic solvents. Chemical properties appear to be those characteristics of the primary amines. May be of interest in the preparation of fibers, dyes, and ion-exchange resins and as a chemical intermediate.

the Case of the 4-Headed Chemical...

or

**formaldehyde isn't
"formaldehyde" any more**

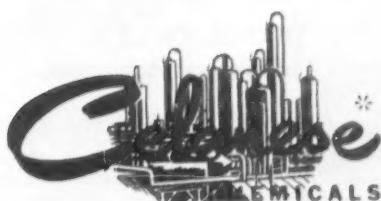


Formaldehyde is Formalin (37% strength in water). It's Paraformaldehyde, with over 91% active chemical. It's Trioxane, when you need anhydrous formaldehyde. Or—for a complete switch—it's Formcel* Solutions—in alcohol instead of water—one big step ahead in making alcoholated resins.

When formaldehyde figures in your formulation, Celanese is your first source. Only Celanese gives you a choice among the "Formaldehyde Four". All four are produced by an integrated process . . . petrochemically . . . completely independent of outside sources. All are available in volume throughout the country.

The right formaldehyde can make the competitive difference—in costs and quality. Talk it over at "headquarters"—your local Celanese representative.

Celanese Corporation of America,
Chemical Division,
180 Madison Avenue, New York 16.



*Reg. U. S. Pat. Off.

C W Report

PD-191, Grade 1. Commercially available through Metal Processing Dept., Pennsylvania Salt Mfg. Co.

PENNSALT FOSBOND 20

Powdered phosphatizing compound for bonding spray cleaning and iron phosphate coating on steel surfaces. Produces a thin, adherent phosphate coating with excellent paint adhesion, easily covered with one coat of paint. Can be used in a simple three-stage cycle. Commercially available through Metal Processing Dept., Pennsylvania Salt Mfg. Co.

PENNSALT FOSBONDS 30, 31 and 32

Three phosphoric acid-base liquid cleaning compounds with varying degrees of inhibition: #30 is highly inhibited, #31 has average inhibition and #32 is not inhibited. Used to remove rust, scale and light soils from steel surfaces. May be employed as part of a Fosbond cycle with other phosphatizing solutions, or used alone (with a Fosrinse seal) as a pre-paint treatment. Used in spray or immersion equipment. Fosbond 30, 31 or 32, with a Fosrinse seal, produce coatings meeting U.S. Government Specifications JAN-C-490, Grade 11, Type 5; and PA-PD-191, Grade 11, Type 5. Commercially available through Metal Processing Dept., Pennsylvania Salt Mfg. Co.

PENNSALT FOSBOND 40

Phosphatizing solution for immersion application of a zinc phosphate coating on iron and steel. Coatings are similar to those produced by Fosbond 10, except that coating weights ranging from 200 to 800 mg. per square foot can be obtained. Fosbond 40 phosphate coatings serve as excellent paint-bond bases and provide superior corrosion resistance in case the paint film is broken. A Fosbond 40 cycle can be used to produce zinc phosphate coatings meeting the requirements of U.S. Government Specifications JAN-C-490, Grade 1; 57 O-2C, Type 2, Class C; and PA-PD-191, Grade 1, Type 1. Commercially available through Metal Processing Dept., Pennsylvania Salt Mfg. Co.

PENNSALT FOSBOND 61

Phosphatizing solution for spray application of a zinc phosphate coating on zinc metal, zinc-plate, galvanized ware and steel. The uniform, fine crystalline coating serves as an ideal paint base for the more severe exposures. While designed specifically to bond with zinc surfaces, Fosbond 61 also produces superior coatings on steel. This allows processing of both steel and zinc parts in the same chemical baths. Commercially available through Metal Processing Dept., Pennsylvania Salt Mfg. Co.

PENNSALT FOSCOAT 40

Phosphatizing solution for immersion application of a heavy zinc phosphate coating on steel. Part of the Fos Process, Pennsalt Foscoat 40 produces coatings which react with and hold the Pennsalt Fosible lubricants used in cold working of steel. The coating also provides a physical separation between work metal and die. Used to promote smoother drawing and longer die life in stamping, deep drawing, cold steel extrusion, and wire, tube and bar drawing. Commercially available through Metal Processing Dept., Pennsylvania Salt Mfg. Co.

FREON-112" TETRACHLORODIFLUOROMETHANE

$\text{CCl}_2\text{F-CCl}_2\text{F}$, M.W., 203.8. B.P. at 1 atm., 92.8° C. (199° F.). Freezing point of purified product, 26° C. (78.8° F.); freezing point of standard solvent grade product, 50-70° F. Critical temperature, 278° C. (532° F.). Liquid density at 25° C. (77° F.) 1.6447 g./cc. Index of refraction at 25° C. (77° F.) 1.413. Color, white solid or colorless liquid. Odor, slightly camphor-like when concentrated. Weight per gallon, 13.8 lbs. Use: Nonflammable, nonexplosive degreasing solvent; generally blended with other solvents to reduce their flammability or toxicity, or to change or modify their characteristics or properties. Availability: Semi-commercial quantities. "Kinetic" Chemicals Div., E. I. du Pont de Nemours & Co. Inc.

"FREON-12B1" MONOBROMOMONO-CHLORODIFLUOROMETHANE

CBrClF_2 , M.W., 165.4. B.P. at 1 atm., -4° C. (25° F.), F.P. -160.5° C. (-257° F.). Critical Temperature, 153.8° C. (308.8° F.). Critical pressure, 595 psia. Critical density, 0.713 g./cc. Incorporates high fire extinguishing effectiveness with a low degree of toxicity, obtained by combining fluorine atoms and bromine atoms in the same chemical molecule. Presence of the fluorine atom in a molecule greatly increases the stability of the compound. Fire extinguishing effectiveness is provided by the presence of bromine and, in general, these new fluorinated agents are more effective than fire extinguishing compounds now available. The effectiveness in most cases is equal to or better than that of methyl bromide. Availability: Experimental quantities. "Kinetic" Chemicals Div., E. I. du Pont de Nemours & Co. (Inc.)

"FREON-12B2" DIBROMODIFLUOROMETHANE

CBr_2F_2 , M.W., 209.8. Boiling point at 1 atm., 24.6° C. (76.1° F.). Freezing point, -141.6° C. (-222.9° F.). Critical temperature, 198.2° C. (388.7° F.). Critical pressure, 600 psia. Critical density, 0.844 g./cc. Availability: Semi-commercial. "Kinetic" Chemicals Div., E. I. du Pont de Nemours & Co. (Inc.)

"FREON-13B1" MONOBROMOTRIFLUOROMETHANE

CBrF_3 , M.W., 148.9. Boiling point at 1 atm., -57.8° C. (-72.0° F.). Freezing point, -168° C. (-270.4° F.). Critical temperature, 67.0° C. (152.6° F.). Critical pressure, 575 psia. Critical density, 0.745 g./cc. Availability: Semi-commercial. "Kinetic" Chemicals Div., E. I. du Pont de Nemours & Co. (Inc.)

"FREON-114B2" DIBROMOTETRAFLUOROETHANE

$\text{CBrF}_2\text{-CBrF}_2$, M.W., 259.9. Boiling point at 1 atm., 47.5° C. (117.5° F.). Freezing point, -110.5° C. (-166.8° F.). Critical temperature, 214.5° C. (418° F.). Critical pressure, 510 psia. Critical density, 0.790 g./cc. Availability: Experimental quantities. "Kinetic" Chemical Div., E. I. du Pont de Nemours & Co. (Inc.)

FROST

Powdered chlorine-type bleach, sanitizer and deodorizer for household use. Granular powder containing 9% available chlorine. Used for home laundry bleaching and stain removal, bathroom and sickroom sanitizing and cleaning. Packed in 7½ oz. jars, 24 per case. Commercially available through Household Products Dept., Pennsylvania Salt Mfg. Co.

FURAN

$(\text{CH}_2)_4\text{O}$, M.W., 68.07; highly volatile, colorless liquid; miscible with most organic solvents; slightly soluble in water; B.P. 31.3° C.; F.P. -85.7° C.; flash point (Tag closed cup) -35.6° C.; weight per gallon 7.8 pounds. Use: chemical intermediate. Furan is an unsaturated compound containing a conjugated double bond system. Addition, substitution and ring opening reactions typical of unsaturated compounds can be effected. Available in commercial quantities. Electrochemicals Dept., E. I. du Pont de Nemours & Co.

NEW PENNSALT FURAN CEMENT

A completely new type of chemical resistant resin cement used to bond brick, tile, ceramic shapes and carbon shapes. This product is sold as a two component product—a siliceous or carbon filler containing catalyst for condensing the resin and the liquid furfural-ketone solution. This new product has the best alkaline resistance, strength, handling characteristics and moderate acid resistance of any of the resin type cements developed in the past. Commercially available. Pennsylvania Salt Mfg. Co.

GLUTARALDEHYDE (25% AQUEOUS SOLUTION)

$\text{OHC-CH}_2\text{CH}_2\text{CH}_2\text{CHO}$, M.W., 100.11; Properties of 25% sol.; Sp. G., 1.066 at 20°/20° C., B.P., 101° C. (760 mm.); V.P., 17 mm. Hg at 20° C.; F.P., -5.8° C.; sol. in water, complete at 20° C.; odor, mild; color, water white. Chemical properties: The two aldehyde groups react through crosslinking to immobilize polyhydroxy compounds and proteins. Suggested uses: Immobilization of polyhydroxy compounds and proteins to give products useful as binders for cork, gaskets and matches; coatings for textiles and paper. Of particular interest for imparting water resistance to polyvinyl acetate latex emulsions and polyvinyl films and for imparting shrink and crease resistance to textiles. Availability: Development quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

GLUTARIC ANHYDRIDE

$\text{OC}(\text{CH}_2)_3\text{COO}$, M.W., 114.10; M.P., 56°C.; B.P., 287.0°C. (760 mm.); V.P., <0.01 mm. Hg at 20°C.; sol. in water, 74.6% at 30°C.; sol. in benzene, 66.1% at 30°C.; sol. in acetone, 77.3% at 30°C.; slightly sol. in ethyl ether; very slightly sol. in carbon tetrachloride and heptane; odor, sharp, penetrating; color, white. Chemical properties: Hydrolyzes to glutaric acid and gives usual reactions of acids of similar chain length. Suggested uses: Preparation of polyester resins and plasticizers; as an intermediate in many chemical syntheses for formation of salts, esters, and amides. Availability: Development quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

GLYCOLONITRILE

HOCH_2CN • M.W. 57.05; Sp. G. 1.104 at 25°C., K.L. 1.4090 at 25°C.; B.P. 98°C. (10 mm.); very soluble in water. Chemical properties possesses an active hydroxyl group and undergoes the usual reactions of a nitrile function. Suggested uses: In the synthesis of metal complexing agents, pharmaceuticals and resins. Availability: Offered as a 50% and 70% aqueous solution in commercial quantities. American Cyanamid Co.

GRIFFCO-22

Polyvinyl acetate emulsion with superior adhesive qualities; 55% min. solids content; non-ionic particle charge; particle size 1 — 8 microns; viscosity 800 — 1000 cps. Use: Polyvinyl acetate adhesives and coatings. Commercially available. Griffin Chemical Co.

GRIFFCO-33

Polyvinyl acetate emulsion with superior water resistance; 55% min. solids content; non-ionic particle charge; particle size less than 2 microns; viscosity 1500-2000 cps. Use: Polyvinyl acetate adhesives and coatings. Commercially available. Griffin Chemical Co.

G.T.O. #5

A general purpose industrial odorant for petroleum products. Imparts excellent coverage at low cost with pleasant odor effect. Fritzsche Brothers, Inc.

GUANIDINE HYDROCHLORIDE TECHNI-CAL, $\text{CH}_3\text{N}_3\text{HCl}$

Physical Properties: White granules, % guanidine hydrochloride not less than 88.8%, M.W. 95.54 M.P. 175-180°C., very stable and soluble in water, hygroscopic and deliquescent, soluble in ethanol; slightly soluble in acetone, benzene, and hexane; crystal habit, equant to tabular. Toxicity: Irritating to skin and mucous membranes. Chemical Properties: Typical of those for a strongly basic amino compound (alkylation, acylation, condensation with aldehydes and esters); suitable for production of imidazoles, triazines, and pyrimidines because of two amino groups present. Suggested Uses: This compound finds its principal outlet as a source of free guanidine. Availability: Commercial quantities. American Cyanamid Co.

EXPERIMENTAL HERBICIDE DCU

Active ingredient, dichloral urea; supplied as a wettable powder containing 73% active ingredient and as a dust concentrate containing 80% active ingredient. Experimental Herbicide DCU is a toxicant for germinating grass seeds and seedlings. It lacks contact phytotoxicity at recommended dosages to established grasses and dicotyledonous plants, is non-corrosive to equipment, and possesses a minimum of toxicological hazards. Suggested for trial in the control of germinating annual grasses in sugar beets, various cucurbits, and seeded onions; and for control of crabgrass in established turf. Availability: Research quantities for further testing within statutory limitations. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

EXPERIMENTAL HERBICIDE NATRIN

Active ingredient, sodium 2,4,5-trichlorophenoxyethyl sulfate. Supplied as a light-colored, water-soluble powder containing 8% active ingredient. Experimental Herbicide Natriin is a germinating seed toxicant that will control broad leafed and grass weeds. It is non-phytotoxic and physiologically inactive when applied to the leaves of plants at dosage recommended for killing germinating weed seeds. Suggested for trial as a pre-emergence weed-killer for the control of weeds in deep-seeded, bulb, corn, and rhizome crops; and as a post-emergence weed-killer after clean cultivation in established seedbeds, transplanted, or perennial crops. Availability: Research quantities for further testing within statutory limitations. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.



ACCOPAK^{*} Pallet

more manhours

AERO^{*} Phthalic Anhydride

Cyanamid is now making "unitized" shipments of AERO Phthalic Anhydride on ACCOPAK Pallets, the revolutionary new pallets made of MELOSTRENGTH^{*} paper for exceptional strength, wet or dry.

Here's how you save:

1. Manhours slashed: in *one-fifth* the manhours it takes to handle bags individually, one man can unload and store an ACCOPAK palletized shipment, using any type fork lift

truck equipped with easily attached bayonet forks.

2. Bulk handling: bags arrive "unitized" on ACCOPAK Pallets, saving you the cost of wooden pallets.

3. Bags protected from damage: bayonet forks slip into durable cardboard tubes in ACCOPAK Pallet, cannot damage bags.

4. Warehouse space saved: ACCOPAK Pallets are thin as heavy wrapping paper, bags are denser, stacks are neater, more compact.

For a fully illustrated description of the ACCOPAK Pallet, how it works, and how it can save you time and money in receiving or shipping, send for descriptive bulletin, "ACCOPAK—a new and revolutionary pallet."

*Trade mark

chemicals
for the
chemical industry



AMERICAN *Cyanamid* COMPANY

Manufacturers Chemicals Department
30 Rockefeller Plaza, New York 20, N.Y.

C W Report

N-HEXADECANE (OLEFIN FREE GRADE)

$C_{16}H_{34}$ M.W., 226.43; M.P., 18.14°C.; B.P., 286.5°C.; Sp. Gr. 20°/4°C., 0.7733; R.I., 1.4343 at 20°C.; Iodine Value, nil; Hydroxy Value, nil; colorless liquid. Higher purity grade because of chemical treatment to remove unsaturates and oxygen-containing compounds. Suggested uses: Special solvent and chemical synthesis; calibration and standardization; still chaser; filler for thermo-elements. Humphrey-Wilkinson, Inc.

1-HYDROXY-2-NAPHTHOIC ACID (FREE ACID AND SODIUM SALT) 1-NAPHTHOL-2-CARBOXYLIC ACID

$C_{10}H_8O_2COOH$, M.W. 188; paste form. Also supplied as a purified grade, in dry lumps, off-white in color; assay on dry basis; min. 98% by pH titration. $C_{10}H_8O_2COONa$, M.W. 210; coarse, gray powder; purity on net weight basis: approximately 72.5%. Dyestuff and miscellaneous intermediate. Commercially available. Antara Chemicals, a Sales Division of General Aniline & Film Corp.

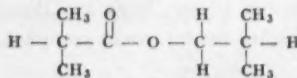
1, 12 HYDROXY STEARYL ALCOHOL—ADOL 45"

Typical specification: Saturated Diol. Avg. Chain Length C₁₈. Hydroxyl groups located in terminal position and 12th carbon atom. M.W., 284.7; M.P., 69 °C.; I.V., 3.0; Sap. Val., .15; Hydroxyl Value, 352; Fire Point, 437 °F.; Suggested Uses: Polyesters, Intermediates, Lubricants, Protective Coatings, Pharmaceuticals, Cosmetics and Surfactants. Availability: Experimental quantities from pilot plant production. Commercial quantities available early 1954. Archer-Daniels-Midland Co.

IRON (OUS) FLUOSILICATE

Ferrous Fluosilicate. $FeSiF_6 \cdot 6H_2O$ M.W. 306.00. Bluish-green crystals, very soluble in water. Grades: technical C.P. Availability: Laboratory scale. City Chemical Corp.

ISOBUTYL ISOBUTYRATE

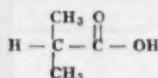


Color, APHA, 15 maximum; Ester Content, 98% minimum; Boiling Range, 146°-148°C/760 mm.; Specific Gravity, 20°/20°C., 0.850-0.860; Acidity, as isobutyric acid, 0.5% maximum; 20°.

Refractive Index, n_D, 1.3990 ± 0.001.

The distinct fruity odor and flavor of Isobutyl Isobutyrate makes it an interesting material for the formulation of perfumes and various flavoring preparations. This material has also been found to show promise in various insect repellent formulations providing protection against chiggers, flies and coddling moths. The high boiling range of Isobutyl Isobutyrate suggests its possible application as a specialty solvent. Eastman Chemical Products, Inc.

ISOBUTYRIC ACID



Color, APHA, 10 maximum; Specific Gravity, 20°/20°C., 0.942-0.956; Isobutyric Acid, 98% minimum; Water, 0.2± maximum; Boiling Range, 95°-152°-154°C/760 mm.; 20°.

Refractive Index, n_D, 1.3930 ± 0.001.

The potassium salt of Isobutyric Acid has been found to be particularly effective as a solubility promoter in the caustic extraction of mercaptans from sour petroleum crudes. It is especially useful in removing mercaptans containing

branch chains of more than three carbon atoms by increasing their solubility in the aqueous phase. Isobutyric Acid also warrants investigation by the manufacturers of flavoring and perfume materials since many of its esters possess desirable odor and flavor characteristics. Isobutyric Acid esters formed by the reaction of the material with glycerin, trimethylolethane and trimethylolpropane also show promise as plasticizers. The diethylene glycol di-isobutyric ester is reported to be a suitable plasticizer for cellulose acetate. This ester is compatible with cellulose acetate while the n-butyl ester is not. Eastman Chemical Products, Inc.

L-ISOLEUCINE O.S. (ALLOISOLEUCINE FREE)

$C_6H_{13}O_2N$, M.W., 131.1; spec. rot. $\{a\}_{D}^{25}$ + 4.0 to + 40.8° (c = 2 in 6N HCl); optically standardized. Suggested uses: biochemical and nutritional research. Schwarz Laboratories, Inc.

ISOMERIZED OLEFINS 3869-A

Typical Properties: Normal straight chain C₁₆-C₁₈ chain length compound. Possess one double bond in non alpha position. Acid No. = .19; I.V. = 111.0; Hydroxyl Val. = 0; Titer = 9 °C.; Flash Point = 280 °F.; Distillation Range @ 3 MM = 115-135 °C. Suggested Uses: Chemical synthesis, resins, plastics, detergents, polymers and plasticizers. Availability: Experimental quantities from Pilot Plant production. Archer-Daniels-Midland Co.

ISOPROPYLAMINOETHANOLS (IPA)

Composition approximately 60/40 by weight of Isopropylmethanolamine and Isopropylisopropanolamine. Molecular Equivalent, 14.5-17.5; Sp. G., 0.91-0.94 at 20/20°C.; Color, amber to straw; I.B.P., 110 °C.; F.B.P., 265 °C.; Flash Point (open cup), 155°F. Used as an intermediate for emulsifiers particularly for wax emulsion floor polishes. Available in commercial quantities from Sharples Chemicals Inc.

p-ISOPROPYL PHENYLACETIC ACID

$C_9H_{14}O_2$ M.W., 178 Assay; 99.0% Min. Acid Number: 312.5; Melting Point: 48-50°C.; Physical Appearance: Pure white, crystalline powder; Suggested Uses: As an intermediate in the preparation of pharmaceuticals and other fine organics. Availability: Small quantities for experimental investigation. Intermediates Sales Department, Verona Chemical Company.

ISOSEBACIC ACID

A mixture of C-10 dibasic acids having the following composition: L-Ethyl Sebacic Acid -72.80%; L, L'-Diethyl Adipic Acid -12.18%; Sebacic Acid -6.10%; M.W. range 202-205; D at 80°C. 1.025 g/ml.; M.P. range 62-72°C.; Ash 0.2%; Ac. No. 545-555 mg KOH/g; Iod. No. 2.0; Moisture 0.3%; C-10 Dicarboxylic Acid Content 98.5%; odor, slight; color, white to off-white solid. Chemical properties: The two carboxyl groups may enter into condensation and esterification reactions. Suggested uses: In the preparation of polyamides, plasticizers, synthetic lubricants, polyesters of the glass reinforced type, polyester rubbers, alkyds, and monoesters. Availability: small quantities for experimental use. U.S.I. Div., National Distillers Products Corp.

JUVENON SOIL RETARDANT D

An aqueous, thixotropic dispersion which is readily dilutable with water. Primary use of this product is to reduce the soiling of rugs made from all fibers. Carpets treated with this compound require less frequent shampooing and colors stay bright and new looking through longer period of use. May be applied by spraying, roller coating or padding. Commercially available. American Cyanamid Co., Organic Chemicals Div., Textile Resins Dept.

KASIL® #22 POTASSIUM SILICATE

$K_2O \cdot 3.45SiO_2$ (molecular) at 28.6° Baume, 8.6% K_2O , 18.9% SiO_2 . Exceptionally pure—spectrographic analyses indicate absence of copper nickel, other contaminating materials. Suggested uses: cathode ray tube manufacture, used with dehydrating agents such as barium acetate, barium nitrate, sodium sulphate or potassium sulphate, acts as binder of phosphors to face of picture tube; dry strength increased without sacrificing wet strength; good wet strength particularly when settling time is short. Less critical regarding concentration and time than more siliceous potassium silicates. Reduces shrinkage when vibration is present on settling belt. Commercially available. Philadelphia Quartz Company.

KARATHANE WD

An agricultural fungicide wettable powder containing 25% technical Karathane. Active ingre-

dients: 22.5% dinitro (1-methyl heptyl) phenyl crotonate and 2.5% other nitro phenols and derivatives, chiefly dinitro (1-methyl heptyl) phenol. Provides outstanding control of powdery mildews attacking a wide variety of fruit, vegetable, ornamental and field crops. Eradicate and protective action has been demonstrated. Dosages of 1 pound or less per acre are effective. Karathane WD shows effective miticidal properties against European Red Mite and Almond or Brown Mite. Generally compatible with many of the commonly used insecticides and fungicides. Commercially available. Information and samples to qualified research workers on request. Rohm & Haas Co.

KNOX-OUT DUAL USE GARDEN DUST

Combined insecticide-fungicide dust for pest control on flowers, vegetables, and ornamentals in the home garden. Contains DDT, Cryolite and Copper Sulfate. Controls many common blights and mildews, and chewing and sucking insects such as Japanese beetle, Mexican bean beetle, climbing cutworms, certain weevils and borers, and grubworms in turf. Packed in 2-lb. shaker box, 12 per case. Commercially available through Household Products Dept., Pennsylvania Salt Mfg. Co.

KRONITEX K-3 (TRICRESYL PHOSPHATE)

$(RO)_3PO$, Sp. G. @ 20°C./20°C., 1.143; Mid-Boiling Point @ 4 mm., 237°C., R. I. @ 25°C., 1.553. Viscosity @ 20°C., 220-300 cps.; light colored, oily-liquid. Suggested uses: A primary plasticizer for vinyls and other resins with all the normal properties of tricresyl phosphate with a lower specific gravity and lower extraction losses. Availability: Any quantity. Ohio-Apex Division, Food Machinery and Chemical Corp.

KRONITEX MX (TRICRESYL PHOSPHATE)

$(RO)_3PO$, Sp. G. @ 20°C./20°C., 1.195; Mid-Boiling Point @ 4 mm., 242°C., R. I. @ 25°C., 1.561; Viscosity @ 20°C., 60-70 cps.; light colored, oily-liquid. Suggested uses: A primary plasticizer for vinyls and other resins with all the normal properties of tricresyl phosphate with a lower viscosity and better low temperature properties. Availability: Any quantity. Ohio-Apex Division, Food Machinery and Chemical Corp.

LAKE RED C. CP 845

A non-resinated Lake Red C toner which has excellent flow characteristics. Sp. G., 1.76. Bulk density value 0.06821 gal. per lb. Oil absorption 46. Suggested uses: offset printing inks. Commercially available. Pigment, Color and Chemical Div., The Sherwin-Williams Co.

LAUROYL CHLORIDE

$C_7H_{14}O Cl$, M.W. 219.5; R.I. 1.445 at 20°C., B.P. 65°C. (3 mm.); color, water-white, over 19% acid chloride content. Chemical Properties: The chlorine atom is easily replaced by alkoxyl and alkylamino groups. Suggested uses: Synthesis of lauric esters and amides. Availability: Commercial quantities. The Trubek Laboratories.

LEMOL 16-98 POLYVINYL ALCOHOL

A new grade of completely hydrolyzed polyvinyl alcohol offered for maximum tensile strength together with maximum solids content of aqueous solutions. Chemical properties are typical of the alcohol group. Can be reacted with aldehydes and dialdehydes to make a cross linked water insoluble polymer. American Monomer Corp.

LEMOL 65-68 POLYVINYL ALCOHOL

A water soluble, high molecular weight, high viscosity synthetic resin. Has outstanding characteristics of solvent resistance, non-toxicity, toughness, strength, adhesion, heat resistance, and gas impermeability. The fact that it can be dissolved in hot water, but is insoluble in cold water, makes Lemol 65-68 of interest in preparing water resistant adhesives, binders, sizes, and saturants. American Monomer Corp.

D-LEUCINE O.S.

$C_6H_{13}O_2N$, M.W., 131.2; spec. rot. $\{a\}_{D}^{25}$ — 14.5 to — 15.5° (c = 2 in 6N HCl); optically standardized. Suggested uses: biochemical and nutritional research. Schwarz Laboratories, Inc.

LEVULINIC ACID

$C_5H_{8}O_2$, M.W. 116.11. Yellow to brown liquid or crystalline solid. M.P. 28°C. Very soluble in water, glycols, alcohols, ketones, aldehydes, esters and aromatic solvents. Chemical properties: The only available gamma-keto acid. Levulinic Acid is an exceedingly reactive mate-



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Cosden Benzene and Toluene meet American
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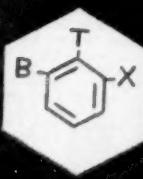
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Industrial Prices . . .

Such Extreme Purity Affords You

FEWER SIDE REACTIONS

BETTER YIELDS

BETTER COLOR



ORGANIC CHEMICALS DIVISION

COSDEN
PETROLEUM CORPORATION
BIG SPRING, TEXAS

rial. Suggested uses: 1) As an ingredient of industrial cleaning and scouring compounds. 2) In paint removers. 3) In soldering. 4) For the pH control of waxes, glues and other materials. 5) In the solvent refining of mineral oils (U.S. Patent 2,087,473 issued 1937) and for hydraulic pressure transmitting fluids (U.S. Patent 1,986,260, issued 1935). 6) As a starting material in the manufacture of plasticizers, and as a raw material for plastics and other polymers. 7) As a catalyst whenever a strongly acidic material is required. 8) As a raw material for the synthesis of chemicals. Availability: Commercial quantities. Chemo Puro Mfg. Corp.

LIGHTFAST BENZIDINE YELLOW D-3086

An easy grinding transparent benzidine yellow having light resistance superior to standard transparent benzidine yellows. Shade: lemon yellow. Sp. G., 1.42; bulking value, 0.08543 gal. per lb.; weight per solid gallon, 11.83 lbs. Suggested uses: plastics, floor coverings, rubber, paints and printing inks. Commercially available. Pigment, Color and Chemical Div., The Sherwin-Williams Co.

PENCO LINDANE-MERCURY 37-1

A combination formulation of 37% lindane and 1.75% phenyl mercuric ammonium acetate used as a seed protectant and disinfectant for wheat and barley. The mercury content is 1% expressed as metallic. The product is in the form of a heavy slurry and is designed for use with water in conventional mechanical seed treaters for combination insect and fungus disease control. Penco Lindane-Mercury 37-1 is artificially colored so that the treated seed can be readily distinguished from the untreated seed since the treated seed must be used for planting purposes only. Commercially available. Pennsylvania Salt Mfg. Co. of Washington.

LITHIUM CHROMATE ANHYDROUS

Li_2CrO_4 . M.W. 147.9 Yellow crystalline powder. Extremely soluble in water. Suggested use: In hydrostating testing; an anti-corrosion agent; in analytical chemistry. Availability: Experimental quantities. Chemo Puro Mfg. Corp.

L-LYSINE MONOHYDROCHLORIDE

$\text{H}_2\text{N} \cdot (\text{CH}_2)_4 \text{CH}(\text{NH}_2)\text{COOH} \cdot \text{HCl}$ M. W., 182.65; white, crystalline solid; M.P. 263-264°C. Soluble in water; insoluble in common organic solvents. Essential amino acid, naturally-occurring form. Application: increasing the protein value of bread, flour, breakfast cereals, live-stock and poultry feeds; pharmaceuticals. Available in semi-commercial quantities. Electrochemicals Dept., E. I. duPont de Nemours & Co.

PENCO MALATHION E-8

A highly concentrated emulsifiable solution of malathion (O,O-dimethyl dithiophosphate of diethyl mercaptosuccinate), used as an insecticide spray after dilution with water. The product contains 8 lbs. of actual malathion per gallon or 80% by weight and is effective against many species of insects and mites attacking fruit and vegetable crops and ornamentals. The usual rates of dilution are from 1 to 1½ pints per 100 gallons of spray. Penco Malathion E-8 is approved for fly control, including applications inside dairy barns, as a residual spray or as a bait spray in combination with sugar, corn syrup or molasses. Commercially available. Pennsylvania Salt Mfg. Co. of Washington.

MALEIC ANHYDRIDE, $\text{C}_4\text{H}_2\text{O}_3$

Maleic anhydride is soluble in benzene, acetone, chloroform, and ethyl ether, and sparingly soluble in alcohol, carbon tetrachloride, xylene and petroleum ether. M.W., 98.06, 99. gr., (60/20°C.) 1.305. Solubility in H_2O @ 50°C. (g./100 g.) 16.3. Uses: Manufacture of alkyd resins, polyester resins, esters, modified and upgraded drying oils, resin sizes, surface active agents, plasticizers, rubber chemicals, agricultural chemicals, textile sizes, pharmaceuticals and stabilizers for vinyl resins. American Cyanamid Co.

MALEIC ANHYDRIDE (TABLETS)

$(\text{CH}_2\text{CO})_2\text{O}$. M.W. 98.06. These new tablets

are an improved form of maleic anhydride that resist breakage in handling. Commercially available from new facilities at Moundsville, West Virginia. An important intermediate in the production of polyesters, alkyds, drying oils, varnish resins, and core oils. National Aniline Div., Allied Chemical & Dye Corp.

MANGANESE (OUS) FLUOSILICATE

$\text{MnSiF}_6 \cdot 6\text{H}_2\text{O}$. M.W. 305.08. Pale pink crystals. Soluble in water. Grades: Technical, C.P. Availability: Laboratory scale. City Chemical Corp.

MAYVAT BROWN LL PASTE

A new anthraquinone vat dye which has extremely good fastness properties and also is extremely fast to peroxide bleaching. Otto B. May, Inc.

MAYVAT GREY 2G DOUBLE PASTE

A new anthraquinone vat dyestuff. This grey has outstanding fastness properties combined with level dyeing qualities. These characteristics make it one of the most popular greys, both in the field of piece goods and yarn dyeing. Otto B. May, Inc.

MAYVAT KHAKI BGR PASTE

A new anthraquinone vat dyestuff which has good fastness properties. Its excellent dyeing behavior makes this product outstanding for producing khaki and olive shades with a minimum of dyeing problems. Otto B. May, Inc.

MAYVAT MAROON FB PASTE

A new anthraquinone vat dye which has extremely good fastness properties and also is extremely fast to peroxide bleaching. Otto B. May, Inc.

MEKOMASK

An industrial odorant especially effective for methyl ethyl ketone. This specialty assures economic odor modification. Fritzsche Brothers, Inc.

MELAMINE "PULVERIZED GRADE", $\text{C}_3\text{N}_6\text{H}_6$

A finely pulverized grade of Melamine, 99% of which will pass through a 200-mesh screen. Suggested uses: As a deodorizer in preparation of foam rubber products. American Cyanamid Co.

2-MERCAPTOBENZOAZOLE

$\text{C}_8\text{H}_7\text{S} + \text{C}(\text{SH})\text{O}$. M.W. 169. Light tan crystals. Characteristic odor. M.P. 183°-187°C. Soluble in ether, alcohol and hot water. S.I. Sol. cold water. Availability: research quantities. Monsanto Chemical Co., Organic Chemicals Div.

2-MERCAPTOETHYLAMINE HYDROCHLORIDE

$\text{HS-CH}_2\text{CH}_2\text{NH}_2 \cdot \text{HCl}$ Mol. Wt.: 113.61; M.P.: 70.2-70.7°C. Description: slightly hydroscopic white crystals. Purity: 96% min. M.P.: 69°C min. Mercaptoethylamine hydrochloride and mercaptoethylamine salicylate have been reported to give protection against x-rays and to be therapeutic agents for clinical radiation sickness. Mercaptoethylamine has also been used to prepare sulfonating pyrimidines and uric acids of possible biological interest, as well as analogues of pantethenic acid. Mercaptoethylamine is one of the components of coenzyme A; it is tied to pantethenic acid by an amide linkage. It is relatively nontoxic; the fatal dosage by subcutaneous injection of mice is 900 mg/kg. Solutions of the free base can be prepared easily by adding an equivalent of sodium methoxide in alcohol to an alcoholic solution of the hydrochloride. The resulting salt can be filtered off and the alcoholic base solution used for preparing other derivatives. Evans Chemetics, Inc.

METHACROLEIN DIMER (2-(2-DIMETHYL-2-FORMYL-2,3-DIHYDRO-1,4-PYRAN)

$\text{C}_8\text{H}_{12}\text{O}_2$. M.W., 140.18; Sp. G., 0.996 at 20°/20°C.; R.I., 1.4531 at 20°C., color, water white. Chemical properties: Hydrolyzes to form 2,5-dimethyl hydroxypaldehyde; reacts with hydrogen to form 2,5-dimethyl tetrahydropyran-2-methanol; the double bond reacts with alcohols and phenols to form the corresponding alkoxyl and phenoxy substituted dimethyl formyl tetrahydropyran; the aldehyde group reacts with ammonia, amines, and alcohols and can be oxidized to the corresponding acid. Suggested uses: As an intermediate for chemical syntheses. Availability: development quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

METHACROLEIN DIMER (2-(2-DIMETHYL-

2-FORMYL-2,3-DIHYDRO-1,4-PYRAN)

$\text{CH}_2(\text{SO}_2\text{H})_2 \cdot 3\text{H}_2\text{O}$. M.W. 310.38. M.P. 140-145°C; stable, tan, free flowing solid. Technical material contains ca. 15% free sulfuric acid. Very soluble in water, soluble in methyl and

ethyl alcohols, insoluble in hydrocarbons. Chemical Properties: Can be brominated or chlorinated. Suggested uses: As a catalyst. Availability: Experimental quantities. Allied Chemical and Dye Corp., General Chemical Div.

METHOXY ACETIC ACID— $\text{C}_3\text{H}_6\text{O}_3$

M.W., 90.1; F.P. min., 7.7°; B.R. at 733 mm. Hg, 197 to 198°C. (lit); Sp. Gr. 25/4, 1.1738; R.I. at 25°C., 1.415; Flash point, 260°F.; Fire point, 260°F.; Acid number, min. 612; Water, (Karl Fischer) max., 0.20%; Chemical intermediate. Commercially available. Dow Chemical Co.

P-METHOXY PHENYLACETIC ACID

$p\text{-CH}_3\text{OC}_6\text{H}_4\text{CH}_2\text{COOH}$. M.W., 166.17; M.P., 85-87°C.; B.P., 184°C. @ 12 mm. Hg; solubility, 9% in water @ 20°C.; appearance, white crystalline flakes. Suggested uses: In the synthesis of pharmaceuticals and other organic chemicals. Availability: Research quantities only. Kay Fries Chemicals, Inc.

METHYL ISOAMYL KETONE

$(\text{CH}_3)_2\text{C}=\text{CHCH}_2\text{CH}_2\text{COCH}_3$. M.W., 114.18; Sp. G., 0.6142 at 20°/20°C.; B.P., 145.4°C (760 mm.); V.P., 1.51 mm. Hg at 20°C.; F.P., -74.21°C.; sol. in water, 0.55% at 20°C.; sol. water in, 1.4% at 20°C.; completely soluble in acetone, benzene, ethyl ether, heptane, methanol, and carbon tetrachloride; Fl. P., 75°F. (open cup tester); rel. evap. rate (n-butyl acetate = 100), 45; toluene dil. ratio, 3.8; naphthalene dil. ratio, 1.1; bluish resistance, 89% rel. hum. at 80°F.; color, white. Chemical properties: Carbonyl group undergoes usual reactions. Suggested uses: As a solvent in nitrocellulose lacquers and vinyl coatings. Availability: development quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

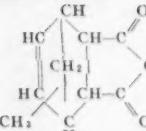
METHYL MERCAPTAN

Synthetic methyl mercaptan, CH_3SH ; Boiling Range, 6.1-6.7°C; purity, 98.0, color, water white. Chemical properties: One of the basic chemicals in synthesis of methionine and other organic sulfur compounds. Used in manufacture of insecticides, plastics, and various organic intermediates where a methyl thio ethyl linkage is necessary. Will dehydrogenate to dimethyl sulfide; oxidize to disulfide, sulfoxide, and sulfane. Adds to a double bond to form saturated thio ether. Has many reactions analogous to those of methyl alcohol. Availability: Tank car quantities. Index Chemical Co.

METHYL MERCAPTAN

CH_3SH M.W., 48.10; synthetic material, min methyl mercaptan content, 98.0 mol percent; colorless liquid or gas; normal B.P., 43.7°F; Sp.G., 0.879 at 5°/4°; vapor pressure, 25.6 psi at 70°F. and 73.2 psi at 130°F.; water cloud point, -25°F. max. Suggested uses: Intermediate in chemical synthesis, gas odorant. Commercially available Dec. 1, 1954. Pan American Chemicals Div.

METHYL NADIC ANHYDRIDE (X-METHYL ENDOMETHYLENE TETRAHYDROPHthalic ANHYDRIDE)



M.W. 178.2, B. P. 136-137°C at 4.6 mm. A pale yellow, somewhat viscous liquid soluble in benzene, toluene, acetone, carbon tetrachloride, chloroform and ethyl acetate; slightly soluble in petroleum ether. An intermediate for the preparation of resins, plastics, plasticizers, paints and varnishes. Available in small research quantities. National Aniline Div., Allied Chemical & Dye Corp.

METHYL n-PROPYL KETONE

$\text{CH}_3\text{COCH}_2\text{CH}_2\text{CH}_3$. M.W., 86.13; Sp. G., 0.8067 at 20°/20°C.; distillation range, 101.4°-103.1°C. (760 mm.); R.I., 1.3900 at 20°C.; very slightly soluble in water; completely soluble in ethyl alcohol; color, water white. Chemical properties: First time this product has been available as a pure material; undergoes usual reactions of carbonyl group. Suggested uses: Lacquer and resin solvent; dewaxing solvent for lubricating oils; pharmaceutical intermediate. Availability: commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

N-METHYL-2-PYRROLIDONE

$\text{CH}_2\text{CH}_2\text{CH}_2\text{CONCH}_3$ M.W. 99.01, Sp. G.

BIG

PROFIT OPPORTUNITY IN LIQUID DETERGENTS

STEPAN Complete Line of Liquid Detergent Bases Helps Soapers Cash-In

From heavy-duty floor cleaners to bubble bath specialties...from textile scouring compounds to milady's creme shampoos, there are Stepan liquid detergent bases and finished formulations available to help you develop your own product.

Included in the Stepan line of liquid detergent base materials are the new higher fatty alcohols and fatty alcohol sulfates important for superior detergency and mildness to the skin in such products as liquid dishwashing detergents, heavy-duty household detergents and other detergents in either liquid, solid, or flake form.

The completeness of the Stepan line of base materials makes it possible for you to select just exactly the correct ingredients for blending to your use and price requirements.

Why not let Stepan materials, facilities, and experience help you to capitalize on the big and growing liquid detergent market?

Liquid Alkyl Aryl Sulfonates

The Stepan line includes a variety of liquid alkyl aryl sulfonates offering economical sources of active ingredients and tailored to meet various price and end use requirements. Among these products and of special interest are DS-60 and DS-35 de-salts sodium alkyl aryl sulfonates. In addition to their uses as a liquid dishwashing detergent base, these products are ideal as bases for scrub soaps, dairy cleaning compounds, or any other cleaning compound which requires the combination of economy, superior detergency, and superior wetting action.

Non-Ionic Detergents and Foam Stabilizers

Stepan LDA, an alkylolamide, provides exceptional foam sta-

bility and is highly recommended for use in alkyl aryl sulfonate and fatty alcohol sulfate formulations where high foam stability is desired.

Amides—Stepan can also produce special amide type non-ionic to your own specifications. Our large production capacity may well effect important savings to you on products of this type.

Sulfated Alcohols

Lauryl Sulfates—An extremely wide range of sodium, ammonium, potassium, and triethanolamine lauryl sulfates are available for detergent and other uses. These are obtainable in paste, liquid, or powder forms and are unmatched for purity and uniformity.

Higher fatty alcohol sulfates—These new products in the Stepan line offer excellent detergency and

20.2% of the market in four years is the record for a liquid dishwashing detergent in one major city. It now outsells all other dishwashing products in that market. Synthetic detergents as a whole have captured better than 50% of the market, nationally. Stepan Chemical Company has a complete line of liquid detergent bases and finished formulations to help soapers profit from this growing market. Many of these base materials are also advantageous for use in solid, flake, or paste form detergents.

the additional advantage of low de-fattening to the skin. They are ideal for use in shampoos, heavy-duty household detergents, and other detergents in liquid or solid form.

Savings Through Stepan Blending Service

The completeness of the Stepan line can also make possible consolidated raw material buying. This, in combination with Stepan's extensive blending facilities, can effect important savings for you.

Carload total of less than carload ingredients, where suitable, can be blended at small additional cost and carload price savings effected on the individual items.

Laboratory Assistance

The Stepan Chemical Company has had over twenty years experience in the field of synthetic detergents. This experience and the new Stepan laboratory facilities are available to help you in developing and producing your detergent product.

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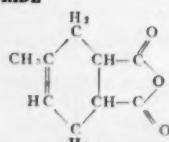
C W Report

25°/4°C 1.027, F.P. —24°C, B.P. 202°C, R.I. 1.469. Clear colorless liquid with a mild odor. Soluble in water and many organic solvents. Solvent for polyacrylonitrile, methyl methacrylate polymer, polystyrene, cellulose triacetate and many other resins difficult to dissolve. Capable of dissolving 39 times its own volume of acetylene at room temperature. Chemical properties: Source of γ -methylaminobutyric acid. Suggested uses: Powerful general organic solvent. Selective solvent for acetylene in natural gas. Availability: Semi-commercial quantities. General Aniline & Film Corp.

METHYL SORBATE

$\text{CH}_3\text{CH}=\text{CHCH}(\text{CH}_3)\text{COOCH}_3$ M.W. 126 Colorless liquid. Uses: As a component in Diels-Alder syntheses. As a plasticizer. As a copolymer. Availability: Pilot plant quantities. Eastern Chemical Corp.

METHYL TETRAHYDRO PHTHALIC ANHYDRIDE



M.W. 166, Setting Point 63°C. A coarse white crystalline powder. Soluble in benzene, ether and acetone; insoluble in paraffin hydrocarbons. Suggested as an intermediate in the preparation of resins, plastics, plasticizers, paints, and varnishes. Available in small quantities for experimental purposes. National Aniline Div., Allied Chemical & Dye Corp.

2-METHYL-2-THIOPSEUDOURA SULFATE

$(\text{C}_2\text{H}_5\text{N}_2\text{S})_2\text{H}_2\text{SO}_4$ M.W. 287.36 2-Methyl isothiourea Sulfate. White crystals. MP 235-6°C. with decomposition. Soluble in water, insoluble in alcohol. Grade: pure (m.p. 235-6° dec.) Availability: Laboratory scale. Use: Synthesis of amino alkylene guanidines. City Chemical Corp.

METHYL VINYL ETHER-MALEIC ANHYDRIDE COPOLYMER (PVM/MA)

Density 1.3 to 1.4 g/ml. Specific viscosity (range of viscosities) 0.2 to 3.5. White amorphous powder soluble in water (with hydrolysis), acetone, methyl acetate, pyridine. Dissolves in alcohols with reaction to half esters. Compatible with cellulose acetate, polyvinyl alcohol, phenol-formaldehyde resins, etc. Suggested uses: Components in thickeners, binders, emulsions, coatings, dispersions, adhesives. Availability: Semi-commercial quantities. General Aniline & Film Corp.

METHYL VINYL ETHER-MALEIC ANHYDRIDE COPOLYMER HALF AMIDE (PVM/MA HALF AMIDE)

Density 1.2 to 1.3 g/ml. Viscosity grades within range 100 to 20,000 centipoises (1% aqueous solutions at 25°C.). White amorphous powder, soluble in water and in ethylene glycol, chlorobenzene and phenol. Suggested uses: Component in thickeners, binders, emulsions, coatings, dispersions, adhesives. Availability: Semi-commercial quantities. General Aniline & Film Corp.

METSO® ANHYDROUS SODIUM METASILICATE

Na_2SiO_3 . Technically pure anhydrous sodium metasilicate. Over 50% sodium oxide. A 1.0% sol. has a pH of 12.8. Detergent action penetrates dirt, saponifies or emulsifies animal, vegetable or mineral oils. Soluble silicate aids in preventing removed soil from re-depositing; controls corrosive action of the sodium oxide. Suggested uses: as detergent where vigorous cleaning action is desired; as ingredient in industrial cleaning compounds with synthetic detergents, caustic soda, phosphates, carbonates or soaps. Commercially available. Philadelphia Quartz Co.

METSO® 200, SODIUM ORTHOSILICATE

Alkali-silica ratio 2:1. Highly concentrated sodium orthosilicate. Approximately 60% sodium oxide (Na_2O). A 0.5% sol. has a pH of 12.8. Maintains high pH level until alkali is nearly completely exhausted or neutralized. 29% SiO_2 (silica) increases detergency by aiding emulsification, or saponification of oils, deflocculation of solid dirt and holds soil in suspension. Suggested uses: cleaning operations that require extra strong alkaline activity; cleaning ferrous metals prior to electroplating and enameling; soaker tank cleaning. Commercially available. Philadelphia Quartz Co.

MICA MAT

Inorganic paper composed solely of very thin flakes of partially dehydrated mica. Has a tensile of about 1500 psi and excellent uniformity of thickness and dielectric properties. Is replacing mica splittings imported from India in many applications in electrical equipment. Should find application in the chemical field. Available in 200 pound rolls, 40 inches wide and thicknesses of 0.001", 0.002", and 0.004". Commercially available. General Electric Co.

MILORI BLUE 50-1760

An easy grinding ink type iron blue of high strength. Sp. G. 1.83; wt./gal. 15.25; bulking value 0.0655; Oil Abs. 40. Suggested uses: Letter press; Lithographic; Intaglio; Moisture-set. Commercially available. American Cyanamid Co., Pigments Div.

MISCH METAL

A mixture of the rare earth elements in metallic form with the approximate composition: Cerium, 45%; Lanthanum, 30%; Neodymium, 17%; Praseodymium, 6%; Gadolinium, 1%. It is furnished in the following forms: Piglets: 2½" in diameter, 1½" high weighing 1 lb. Rings: Doughnut-shaped with 1¼" center hole, furnished in 1-lb, 2-lb and 5-lb sizes. Segments: Approximately 1" x 1" x ¾" weighing 1 ounce. A brief statement of its uses follows: Improves the hot workability, particularly in stainless steels. In ferrous metallurgy as a grain refiner and deoxidant. As a nodularizing agent in casting ductile iron. An important component of the magnesium-rare earth-zirconium alloys having high temperature creep resistance. For application in jet engines. Mallinckrodt Chemical Works.

MONOCHLORODIFLUOROACETIC ACID

$(\text{CCl}_2\text{COOH})_2$ M.W. 130.49; F.P. 23°C.; B.P. 122°C.; water white pungent liquid; dissolves exothermally in water in which it is completely soluble; miscible with many organic solvents. Chemical Properties: Very strong acid. Suggested Uses: Catalyst for many organic reactions, particularly esterifications and condensation reactions. Availability: Experimental quantities. Allied Chemical and Dye Corp., General Chemical Div.

MONOCHLORODIFLUOROACETIC ANHYDRIDE

$(\text{CCl}_2\text{CO})_2\text{O}$ M.W. 242.95; B.P. 95.5°C; water white pungent liquid; dissolves exothermically in water with conversion to the acid; miscible with most inert solvents. Chemical Properties: Readily forms mixed anhydrides, powerful acylating agent. Availability: Experimental quantities. Allied Chemical & Dye Corp., General Chemical Div.

MONOMETHYLOL DIMETHYL HYDANTOIN (MDMH)

$(\text{CH}_3)_2\text{C}(\text{N}(\text{CH}_2\text{OH})\text{CO-NH-CO})$ M.W. 158.156; white, crystalline solid; an odorless donor of formaldehyde; M.P. 99-103°C. (210-217°F.); 18.98% combined formaldehyde. Soluble in water, methanol, and acetone. Slightly soluble in ethyl acetate; insoluble in hydrocarbons, trichloroethylene, carbon tetrachloride, and diethyl ether. Reacts as a substituted hydantoin or as an odorless formaldehyde donor. Suggested uses: textile and paper finishing and as a neutral source of formaldehyde for disinfecting, embalming, and protein hardening. Available in commercial quantities. Electrochemicals Dept., E. I. duPont de Nemours & Co.

DIAMOND CRYSTAL MONOSODIUM GLUTAMATE SALT

Alberger Fine or Fine Flake Salt containing ten percent monosodium glutamate. Enhances flavor of potato chips, salads, soups, melted milk mix, meat products, and popcorn. The ideal carrier for monosodium glutamate. Diamond Crystal Salt Co.

MURATIC ACID—20° BAUME

Technical grade muratic acid; a water white to pale, straw yellow liquid. Sp.G. @ 60° F. 1.1609, HCl, 31.64%, 9.67 lbs./gal. @ 60° F.

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IGEPAL® CO-630 *is in a class by itself!*

TWENTY YEARS of continuous research by the leading manufacturer of nonionic surfactants, has culminated in this superior 100% active ingredient Igepal, which is tops in performance because it is tops in quality. Consider these new "plus" features:

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6

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- 5 Cover mal-odors to prevent a public nuisance.
- 6 Mask the unpleasant odors of cheap unrectified solvents.

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C W Report

P.P. — 47° F. Pennsylvania Salt Mfg. Co. of Washington.

NACCONOL SL

An anionic synthetic organic detergent composition. A pale yellow liquid having an organic strength of 35-38% with a haze point of 0°C or below. Suggested for use in the manufacture of textiles, leather, paper, proprietary cleaners, cosmetics, and fertilizers and superphosphates; in laundries and dairies; in washing automobiles, trucks, buses, trains, and airplanes; in fruit and vegetable washing. Available in commercial quantities. National Aniline Div., Allied Chemical & Dye Corp.

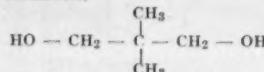
2,3-NAPHTHALENEDIOL (2,3-DIHYDROXY-NAPHTHALENE)

$C_{10}H_8(OH)_2$, M.W. 160; nearly white powder, sometimes slight pink in color; purity on dry basis: min. 90.0%. Suggested uses: photo-chemical intermediate. Semi-commercially available. Antara Chemicals, a Sader Division of General Aniline & Film Corp.

NAPHTHOYL RED DARK D-3049

A naphthol red with outstanding resistance to cleaning solvents and light especially in weak tints. Sp. G., 1.37. Bulking value 0.08764 gal. per lb. Oil absorption 60. Suggested uses: plastics, textile printing colors, synthetic fibres and printing inks. Commercially available. Pigment, Color and Chemical Div., The Sherwin-Williams Co.

NEOPENTYL GLYCOL (2,2-DIMETHYL-1,3-PROPANEDIOL)



Form. Crystalline Solid; Color, White; Boiling Range, 95% between 207°-212°C @ 760 mm; Melting Point, 110°-127°C; Purity, 96% Minimum; Neopentyl Glycol can be used in the synthesis of ester type plasticizers. When reacted with mono basic acids, such as 2-ethylhexoic acid or pelargonic acid, Neopentyl Glycol produces plasticizers which are especially useful in imparting low temperature flexibility to vinyl films. The polymeric plasticizers formed upon the reaction of Neopentyl Glycol with dibasic acids, such as phthalic, sebatic and adipic, are all of low viscosity and impart excellent mechanical and permanence properties to vinyl film. Neopentyl Glycol can be used as a basic raw material for the production of unsaturated polyester resins imparting good styrene solubility and high tensile and flexural strength. It can also be used as a modifying agent for alkyl resins. The monoesters of Neopentyl Glycol should be considered as constituents of hydraulic fluids. The diesters show promise as lubrication oil additives, contributing to better low temperature characteristics. The diesters also may be useful as specialized synthetic lubricants. Neopentyl Glycol has also been found to show some activity as an insect repellent for protection against mosquitos and chiggers. Eastman Chemical Products, Inc.

NEOPRIME A, B, AND C

Special primers for steel, concrete, wood and non-ferrous surfaces compatible with Pennsalt NeoCoat Systems to permit good adhesion to surfaces and compatibility with internally catalyzed neoprene products such as Pennsalt NeoCoat. Commercially available. Pennsylvania Salt Mfg. Co.

NEOPUTTY

A neoprene putty applied by knife, trowel or manually as an expansion joint material in acid-proof brick linings, caulking, filling cavities and smoothing rough surfaces prior to neoprene liquid or sheet linings and rubber linings. Commercially available. Pennsylvania Salt Mfg. Co.

NEOPUTTY TIE CEMENT

A special primer required for use in the application of neoprene putties such as Pennsalt NeoPutty to surfaces primed with other standard

primers. This product is used as a tie coat between the primer and the NeoPutty. Commercially available. Pennsylvania Salt Mfg. Co.

NEOWHITE D LIQUID

A liquid whitening and brightening agent (optical bleach); stable, clear amber liquid, soluble in water, salt free. Use for liquid soaps, detergents, cleaners, shampoos, blueings, starches, finishes, wax emulsions and other household products. Can be metered for continuous operations in paper and textile mill applications. Available in commercial quantities. Fiber Chemical Corp.

"NIATEX" ANTISTATIC AGENT AG-1

A durable antistatic finish for use on synthetic fibers such as nylon, Dacron, Orlon, Acrlan and acetate. Product is supplied as a colorless, 40% aqueous solution. "Niatex" AG-1 can be applied by padding and fixed on the fabric by heat treatment at 160°-250°F. The finish imparts an excellent hand to the fabric and is not removed by washing or dry cleaning. Availability: semi-commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

o-NITROBENZENESULFENYL CHLORIDE

$o\text{-NO}_2\text{C}_6\text{H}_4\text{SCl}$ M.W. 189.5. Yellow crystals. C.P. 73-74°C. Slightly irritating odor. Decomposes explosively at ca. 170°C. Soluble in benzene, acetic acid and chloroform. Sl. Sol. in ether, carbon tetrachloride. Insol. in water. Availability: Research quantities. Monsanto Chemical Co., Organic Chemicals Div.

m-NITROPHENOL

$C_6\text{H}_5\text{NO}_3$, M.W. 139. Monoclinic crystals. Sl. Sol. Water. Sol. Organic solvents and alkalies. This is an unusually oriented nitrophenol. Uses: As an intermediate for the synthesis of meta-substituted phenols. Availability: Pilot plant quantities. Eastern Chemical Corp.

NOPS* SPECIAL ACCELERATOR

N-oxydiethylenebenzothiazole-2-sulfenamide M.W. 252.35; Sp. G. 1.37; M.P. 75-80°C; insol. in water; sol. in benzene, acetone, methanol; color-yellow; odor-sweet, masked by morpholine after sealed storage. Uses: A delayed action accelerator for the vulcanization of both synthetic and natural rubber, particularly in the presence of high pH furnace blacks. Commercially available. American Cyanamid Co., Organic Chemicals Div., Intermediate and Rubber Chemicals Dept.

NONIC 300

A non-ionic surface active agent of the polyethylene glycol alkylphenyl ether type. Color, clear, pale straw; Activity, 9.5%; Sp. G., 1.06 at 20°/20°C.; Cloud Point (1% aqueous solution), 56°C.; Flash Point, above 400°F. Nonic 300 is soluble in many chlorinated compounds, alcohols, ketones, esters, aromatic hydrocarbons and water. It has excellent stability to acids, alkalies and oxidizing agents. Suggested uses: Wetting agent, detergent, emulsifying agent. Available in commercial quantities from Sharples Chemicals Inc.

NOPCO GS #10

A nitrogen containing ethylene oxide condensate exhibiting freezing point, viscosity, hygroscopic and plasticizing properties like glycerine. This 100% active water white mobile liquid is completely soluble in water in all proportions. Suggested as a glycerine extender or substitute except in food products. Commercially available. Nopco Chemical Co.

NOPCOSIZE D

A water soluble copolymer resin solution effective as a warp size for Dacron continuous filament yarns. Also effective as a warp size or filament binder for other yarns and fibers. Solutions are practically water white and exhibit a pH of approximately 10.5. Commercially available. Nopco Chemical Co.

NOPCOTE 50-PW

A white colored, fluid emulsion of equal amounts of polyethylene and wax containing 40% solids. The emulsion is stable to dilute concentrations of acid and alkali and is recommended for use in coating operations. Commercially available. Nopco Chemical Co.

NUODEX 767

Solution of magnesium naphthenate in petroleum hydrocarbon. 6% magnesium; Sp. G. 0.95; dark amber liquid. Fuel oil additive for reduction of corrosion in high temperature combustion. Commercially available. Nuodex Products Co., Inc.

NUODEX BISMUTH 12%

Solution of bismuth naphthenate in petroleum hydrocarbon; 12% bismuth as metal. Sp. G.

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C W Report

0.999. Thin, pale amber liquid. Suggested uses: lube oil additive; ingredient in pharmaceutical preparations. Commercially available. Nuodex Products Co., Inc.

NUODEX INDIUM 6%

Solution of indium naphthenate in petroleum hydrocarbon; contains 6% indium as metal. Light amber liquid. Sp. G. 0.955. Suggested use: fuel and lube oil additive. Availability: Pilot Plant production. Nuodex Products Co., Inc.

NUODEX POTASSIUM 7%

Solution of potassium naphthenate in a petroleum hydrocarbon; contains 7% potassium as metal. Viscous, amber liquid. Sp. G. 0.965. Suggested use: fuel and lube oil additive; emulsifier. Commercially available. Nuodex Products Co., Inc.

NUODEX SILVER 6%

Solution of silver naphthenate in petroleum hydrocarbon; 6% silver as metal; Sp. G. 0.865. Light amber liquid. Suggested uses: as ingredient in pharmaceutical preparations; reducing agent; spectrographic standard. Commercially available. Nuodex Products Co., Inc.

NUODEX TITANIUM 3%

Solution of titanium naphthenate in a petroleum hydrocarbon solvent; contains 3% titanium as metal. Dark amber liquid. Sp. G. 0.915. Suggested uses: additive for lube oils; ultra-violet screening agent. Availability: Pilot Plant production. Nuodex Products Co., Inc.

NUODEX ZIRCONIUM OCTOATE 6%

Solution of zirconium octoate in petroleum hydrocarbon; containing 6% zirconium as metal. Thin, pale amber liquid. Sp. G. 0.880. Suggested uses: lube oil additive; auxiliary paint drier; polymerization catalyst for silicone resins. Commercially available. Nuodex Products Co., Inc.

NUOGEL® 718

Aluminum soap; density: 0.97; white granules. Powerful gelling agent for aliphatic and aromatic hydrocarbons, also for chlorinated solvents. Used in Hydrafac process for treatment of oil wells. Commercially available. Nuodex Products Co., Inc.

NUOGEL® 719

Aluminum soap; density 0.98; white granules. Powerful gelling agent for aliphatic and aromatic hydrocarbons, also for chlorinated solvents. Used in Hydrafac process for treatment of oil wells. Faster gelling than Nuogel 718. Commercially available. Nuodex Products Co., Inc.

NUOGEL® 753

Aluminum soap; white granules. Specially formulated to yield gels of extremely high viscosity in aliphatic and aromatic hydrocarbons. Used in preparation of temporary and permanent blocking gels in oil well treatment. Commercially available. Nuodex Products Co., Inc.

N-OCTADECANE (OLEFIN FREE GRADE)

$C_{18}H_{36}$ M.W. 254.48; M.P. 28.0°C; B.P. 317.9°C; Sp. G. 20°/4°C. 0.7767; R.I. 1.4369 at 20°; Iodine Value, nil; Hydroxyl Value, nil; colorless liquid. Higher purity grade because of chemical treatment to remove unsaturates and oxygen-containing compounds. Suggested uses: Special solvent and chemical synthesis; calibration and standardization; still chaser; filler for thermo-elements. Humphrey-Wilkinson, Inc.

OCTADECENYL SUCCINIC ANHYDRIDE

$C_{18}H_{34}C_4H_6(CO)_2O$ M.W. 350.53, R.I. 1.469 at 20°; B.P. 240-247°C. at 1.5 mm.; colorless liquid. Made from mixed n-octadecenes. Chemical properties: Forms esters and salts. Displays surface activity. Suggested Uses: Corrosion inhibitor in oils. Intermediate for making surfactants, metallic soaps for use as vinyl stabilizers, fungicides, and in making greases. Increasing water resistance or oil solubility of hydroxyl or amino bearing materials such as cellulose, cot-

ton or leather. Availability: laboratory-scale. Humphrey-Wilkinson, Inc.

MIXED N-OCTADECYLENES

$C_{18}H_{34}$ M.W. 252.47; colorless liquid. Iodine Value, 103; R.I. 1.446 at 20°C. Inhibited, mixed mono-olefins obtained by the acid dehydration of stearyl alcohol. Suggested Uses: Formation of hydrochloric acid acceptors for vinyls, plasticizer formulations and chlorinated biocides, by epoxidizing the double bond. On a commercial scale this product would be the cheapest straight chain olefin available to date. Availability: laboratory-scale. Humphrey-Wilkinson, Inc.

N-OCTANE (OLEFIN FREE GRADE)

C_8H_{18} M.W. 114.2; M.P. -56.8°C; B.P. 125.7°C; Sp. G. 20°/4°C. 0.7026; R.I. 1.3975 at 20°; Iodine Value, nil; Hydroxyl Value, nil; colorless liquid. Higher purity grade because of chemical treatment to remove unsaturates and oxygen-containing compounds. Suggested uses: Special solvent and chemical synthesis; calibration and standardization; still chaser; filler for thermo-elements. Humphrey-Wilkinson, Inc.

SINCLAIR OCTENES

Olefin content 99+%; M.W., 115; Sp. G. 60/60°F, 0.7335; Bromine No. 184; A.S.T.M. Distillation, 228-250°F; Color, Water White. Sinclair Octenes is a high purity branched chain olefin fraction containing about 98 Mol. % C_8 olefins. The reactivity of the double bond permits octenes to undergo typical olefin reactions such as alkylation, oxidation, halogenation, sulfonation, hydro-halogenation and the o xo-synthesis. One of the major uses for C_8 olefins is the manufacture of octyl phenol, an intermediate in the production of non-ionic detergents and other products. The octyl phenol produced from Sinclair Octenes is a liquid, whereas other C_8 olefins yield a solid phenol alkylate. The liquid alkylate is obtained in high yield and is more easily handled and permits improved reaction rates in further processing. The chemical properties of octenes suggest their employment in the manufacture of many other intermediates for a wide range of end uses. Availability: Semi-commercial quantities. Sinclair Chemicals, Inc.

N-OCTYL MERCAPTAN

$C_8H_{17}SH$ M.W. 146.28; B.P., 199°C.; Sp. G. 25°/4°C. 0.8395; R.I., 1.4497 at 25°C.; water white liquid with mild odor. Technical grade: 95% minimum mercaptan assay. Suggested Uses: Polymerization conditioner, chemical intermediate for insecticides, fungicides and oil additives. Availability: commercial. Humphrey-Wilkinson, Inc.

N-OCTYL SUCCINIC ANHYDRIDE

$C_8H_{17}C_2H_5(CO)_2O$ M.W. 212.28; white crystalline solid. Neutral Equivalent, 109. Chemical properties: Forms esters and salts, displays surface activity. Suggested uses: Intermediate for making surfactants and also metallic soaps for use as vinyl stabilizers and fungicides. A dibasic acid for special resins. Increasing water resistance of hydroxyl or amino bearing materials, such as cellulose or cotton. Ingredient in cosmetic preparations to contribute a greaseless, water-repellent film. Availability: laboratory-scale. Humphrey-Wilkinson, Inc.

OIL CASSIA IMITATION #23530 NOT USP

A highly refractive oil having an aldehyde content of 90-92%. Useful as a flavor replacement for the natural oil which cannot be imported at present because of government restrictions. Available in drum quantities. Fritzsche Brothers, Inc.

OIL STAR ANISE IMITATION #23292 NOT USP

This imitation oil possesses physical and chemical properties similar to those of the natural oil. Reproduces well the odor and flavor of the Chinese oil which cannot be imported at present because of government restrictions. It is equal in strength to the natural product. Available in drum quantities. Fritzsche Brothers, Inc.

ORGANO-BORON COMPOUNDS

Boron acetate and a series of borate esters of aliphatic and aromatic alcohols of varying molecular weight and complexity. American Potash & Chemical Corp.

ORONITE HIGH TEMPERATURE HYDRAULIC FLUID 8200

A silicate base hydraulic fluid developed for use in aircraft hydraulic systems operating continuously between the temperatures -65°F to 400°F. Typical inspection: Flash point, 415°F; Viscosity at -65°F, 2557 cSt; Viscosity at 100°F, 33.8 cSt; Viscosity at 210°F, 11.57 cSt; Viscosity at 400°F, 3.82 cSt. Pour Point, below -100°F. Vapor pressure at 400°F, mm Hg, 1.2. Availability: Semi-commercial. Oronite Chemical Co.

C W Report

ORONITE ORSIL FLUID BF-7-S

A hydrolytically stable aliphatic silicate with unusually low pour point, good lubrication characteristics, low volatility at high temperature and excellent viscosity index. Specific gravity 60°F/60°F, 0.872. Flash, 410°F. Viscosity at -65°F, 1734 cs; Viscosity at 100°F, 7.10 cs; Viscosity at 210°F, 2.19 cs. Pour point, below -100. Boiling point at 760 mm Hg, 695°F; at 10 mm Hg, 480°F. Availability: Semi-commercial. Oronite Chemical Co.

OZLO 18M

A co-fumed leaded zinc oxide more efficient in paints than regular leaded zinc oxide. Composition 18% monobasic lead sulfate ($PbO \cdot PbSO_4$). Sp. G., 3.72; weight per solid gal, 47.65 lbs. Suggested use: for paints. Commercially available. Pigment, Color and Chemical Div., The Sherwin Williams Co.

PANTETHINE (N-PENTOTHENYL)-2-AMINOETHYL MERCAPTAN; L. BULGARICUS FACTOR (LBF)

$C_{11}H_{22}O_4SN_2$ Structural formula: $CH_2OH - C(CH_3)_2 - CHOH - CONH - CH_2 - CH_2 - CONH - CH_2 - CH_2SH$. A naturally occurring conjugate of the vitamin pantothenic acid, now available as a synthetic product. Obtained as a viscous syrup or glass; hygroscopic; infinitely soluble in water, ethanol, acetone. Forms soluble mercury mercaptide. Biol. activity: growth factor for several species of lactic acid bacteria. Converted in living organisms to coenzyme A, the coenzyme of acetylation. Available in research quantities. Krishell Laboratories, Inc.

PARA-CHLOROBENZENESULFONYL CHLORIDE

p-C₆H₄SO₂Cl M.W., 194.95. Off-White prismatic crystals. B.P. 141°C at 15 mm. Hydrolyzes slightly in neutral aqueous media; hydrolyzes more rapidly in basic media. Insoluble in water. Soluble in most organic solvents. Availability: research quantities. Monsanto Chemical Co., Organic Chemicals Div.

PARA-METHANE HYDROPEROXIDE (PMHP)

Sp. G. 0.910-0.925 @ 15.5°/4°C. R. I. 1.460-1.475 @ 20°C; Color—Clear, pale yellow liquid. Suggested Uses: Catalyst in cold rubber production, catalyst for use with polyesters and other types of polymerization reactions. Availability: Commercial quantities. Newport Industries, Inc.

PARAMUL REPELLENT DC-1, DC-2

Two package, single bath water repellent. It produces a water repellent finish on a variety of fabrics that is resistant to repeated dry cleanings. The treated fabrics have a soft hand and do not show mark-off. Paramul Repellent D-1 and DC-2 may be applied by padding or by exhaustion. When exhausted onto hydrophobic fibers, the finish shows very good durability to washing and dry cleaning. Commercially available. American Cyanamid Co., Organic Chemicals Div., Textile Resins Dept.

PARA-TOLYLACETIC ACID

White or not darker than a faint pink or faint gray; when air dried to constant weight at 60-70°C it loses not more than 1% of its weight. M.P. 88.91°C; sulfated ash 0.5% max.; a solution of 0.1 gram in 10% aqueous caustic shows not more than a trace of turbidity or insolubles; sulfur negative. Availability: Experimental quantities immediately available; larger supplies readily arranged. New York Quinine and Chemical Works, Inc.

98% PARA-XYLENE

$C_6H_4(C_6H_5)_2$. Specifications: 98% minimum para-xylene content. Typical properties: Purity, 98.4 liquid volume percent para-xylene; Sp. G. at 60/60°F, 0.866; F. P., 12.6°C; Boiling Range, 11.1°C; Colorless liquid. Available for the first time in commercial quantities as a 98% minimum purity product. Uses: Raw material for synthetic

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Briefs

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Film-forming resin which imparts crease resistance to textiles yet does not require high curing temperatures, an added acid catalyst or long curing time is a reaction product of ethylene glycol, urea and aldehyde components, and an alpha-hydroxy monocarboxylic acid.

Lubricants having high thermal stability, resistance to oxidation and low pour point are produced by the copolymerization of ethylene glycol with a dihydroxylalkyl sulfide. The polymerization takes place at temperatures between 175° and 200°C. in the presence of a dehydration catalyst.

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C W Report

fiber manufacture, selective solvent. Availability: Commercially available in tank car quantities. Drum lots available for laboratory and pilot plant development work. Phillips Chemical Co.

PENSUDS PLUS

Powdered detergent for wet-cleaning of garments in dry cleaning plants. Light, fluffy blend of synthetic detergents, wetting, soil-suspending and brightening agents. Produces copious suds in any type of water, and can be used in acid or alkaline wash waters for removing heavy soils on raincoats, curtains, drapes, rugs, etc. Packed in 50 lb. bags. Commercially available through Laundry and Dry Cleaning Dept., Pennsylvania Salt Mfg. Co.

1,5-PENTANEDIOL

$\text{HOCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$. M.W., 104.15; Sp. G., 0.9921 at 20°/20°C.; B.P., 242.5°C. (760 mm.); V.P., <0.01 mm. Hg at 20°C.; Fr. P., -15.6°C.; Visc., 127.8 cps. at 20°C.; sol. in water, complete at 20°C.; completely soluble in acetone and methanol; very slightly soluble in ethyl ether, benzene, and heptane; insoluble in carbon tetrachloride; odor, mild; color, water white. Chemical properties: The two hydroxyl groups undergo the usual reactions of glycols. Suggested uses: As an intermediate for preparation of polyester resins and plasticizers; intermediate for chemical syntheses. Availability: development quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

1,5-PENTANEDIOL (PENTAMETHYLENE GLYCOL)

$\text{HO}\cdot\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$. M.W., 104.15; colorless liquid; B.P., 239°C. (462°F.); M.P., -21 to -23°C. (-6 to -9°F.); flash pt. (Cleveland open cup) 125°C. (257°F.). Suggested uses: in steam-set inks, paper and leather treating and finishing compositions, plasticizer in certain adhesives and cellulose products; pharmaceutical intermediate. Forms esters and polyesters which may find use as plasticizers, emulsifying agents and resin intermediates. Available in semi-commercial quantities. Electrochemicals Dept., E. I. duPont de Nemours & Co.

PENTROX

Liquid solvent-emulsifier for industrial laundry operations. Contains powerful oil and grease solvents blended with penetrating and emulsifying agents. Used for washing overalls, linens, rags, wipers and other heavily soiled classifications. Special oil and grease emulsifying agents in Pentrox assure a complete emulsion in almost any proportion, in the stable oil-in-water form, thus preventing redeposition of oil droplets on cleaned work. Packed in 55-gal. steel drums. Commercially available, Laundry and Dry Cleaning Dept., Pennsylvania Salt Mfg. Co.

PEPTON® 65 PLASTICIZER

Zinc Bis-(orthobenzenamidothiophenate). M.W. 522.0; M.P. about 170°C.; insoluble in water and benzene; soluble in methanol; odorless; color—white. Catalytic plasticizer for natural rubber; particularly active at low temperatures. Commercially available. American Cyanamid Co.

2-PHENYL-5-BIPHENYLOXADIAZOLE

$\text{C}_6\text{H}_5\text{C}_6\text{H}_2\text{N}_2\text{O}\cdot\text{C}_6\text{H}_4\text{C}_6\text{H}_5$. M.W., 298.33; M.P. 122-123°C.; Sol. in toluene 1.72g. Solutions fluoresce in ultraviolet light producing light of 3700A wavelength. Use: solute for liquid scintillation counting. Availability: Laboratory scale. Arapahoe Chemicals, Inc.

PHENYL CINNAMATE

$\text{C}_6\text{H}_5\text{CH}=\text{CHCOOC}_6\text{H}_5$. M.W. 225. White crystals. M.P. 72°C. Insol. Water. Sol. Organic solvents. Pleasant fruity odor. Uses: As a component of perfumes. Availability: Pilot plant quantities. Eastern Chemical Corp.

PHENYLMALEAMIC ACID

$\text{HOOCCH=CHCONHC}_6\text{H}_5$. M.W. 191.18; Sp. G. 1.418 at 30°C. M.P. 190±2°C. (dec.); yellow crystalline solid; insoluble in water and

slightly soluble in ethanol. Chemical reactions: formation of water-soluble alkali metal salts, easily converted to imide derivative and copolymerizes with many monomers. Suggested uses: preparation of resins for synthetic fibers and plastic applications and as an intermediate for the synthesis of new products. Development quantities. American Cyanamid Co.

PHENYLMERCAPTOACETIC ACID

$\text{C}_6\text{H}_5\text{O}_2\text{S}$. M.W. 168. M.P. 63°-66°C., color, off-white crystals. Chemical Properties: Its carboxyl group gives the usual reactions of an organic acid. For example, salts, esters, and amides may be prepared. The presence of the sulfur atom in these derivatives may lead to unusual properties. Suggested uses: Synthesis of pharmaceuticals and other compounds with physiological action. Availability: pilot-plant quantities. The Trubek Laboratories.

PHENYL TRIMETHYL AMMONIUM HYDROXIDE SOLUTION 20-25%

Pale yellow, limpid liquid; miscible in all proportions with chloroform, benzene, and ether; strongly alkaline to litmus; 20% methanol solution containing not less than 20% and not more than 25% phenyl trimethyl ammonium hydroxide; potassium 0.25% max.; toluene 15 vol. % max.; potassium methylsulfate 1% max. Availability: Experimental quantities immediately available; larger supplies readily arranged. New York Quinine and Chemical Works.

PHILCURE 113

Philcure® 113, *tert*-butylsulfonyl dimethyldithiocarbamate, is a powerful rubber vulcanization accelerator of the delayed action type. Optimum vulcanizant properties are obtained during conventional curing cycles with low levels of acceleration. Philcure 113 may be advantageously used in a wide variety of rubber compounds to improve processing safety, reduce acceleration costs, and improve the aging characteristics of the compounded stocks in both the vulcanized and unvulcanized state. The inherent qualities of Philcure 113 make it especially suitable for highly reinforced premium quality synthetic rubber tread formulations minimizing the tendency of such stocks to pre-cure and reducing overall acceleration costs. Availability: Experimental quantities for laboratory evaluation. Market Development Div., Phillips Petroleum Co.

PHOSPHEN 4

B. R. at 5 min. Hg, 255 to 270°C., Sp. G. at 25/1, 1.34; R. I. at 25°C., 1.574; Flash point, >225°C.; Fire point, >400°C.; Assay, by phosphorus analysis, 98.0 - 102.0%; Phenol, max., 0.5%; Inorganic chlorides, none; Acidity, neutral equivalent as mg. NaOH per grm., max., 0.75; saybolt color, max. No. 5. Commercially available. Dow Chemical Co.

PIPERAZINE (ANHYDROUS)

Synonyms: Diethylenediamine, Hexahydropyrazine, $\text{C}_4\text{H}_{10}\text{N}_2$. M.W. 86.14. Colorless or slightly yellow crystals of ammoniacal odor, M.P. 104°C. Very soluble in water and glycols, soluble in alcohol. Chemical properties: A very reactive molecule, with reactive groups in the 1,2,4 and 5 positions. Suggested uses: As an intermediate in the synthesis of organic chemicals and drugs. Availability: Experimental quantities. Chemo Puro Mfg. Corp.

PIPERIC ACID

$\text{C}_12\text{H}_{10}\text{O}_4$. M.W. 218.20. M.P. 217. Yellow needles, insoluble in water and soluble in boiling alcohol. Uses: organic syntheses and insecticides. Availability: pilot plant. Heifetz and Co.

EXPERIMENTAL COATING PITTS CHEM 101E

Pittsburgh Coke & Chemical Co. is marketing on a limited basis a new coal tar base coating, which is a catalytic-setting coal tar-synthetic resin coating of unusual characteristics. The coating is shipped in a two-component system, catalyst shipped separate from the coating base. The working life, after mixing in the catalyst is from six to twelve hours. The applied coating sets to a very hard, tough, glossy-black film in 12 to 24 hours, depending on the temperature. Applications made thus far indicate that the coating gives excellent protection inc petroleum products even under continuous immersion, is not affected by salt water or spray, hydrogen sulfide, dilute inorganic acids and alkalies, and is quite resistant to aromatic hydrocarbons. It is indicated that the coating will have many applications in chemical plants to protect piping and equipment from spillage of chemicals, chemical fumes, protection of waste tanks and handling equipment, and for underground structures and piping. The coating is well suited for the petroleum industry as a lining for crude oil storage tanks and protection of refinery equipment. The coating withstands temperature up to 300°F. and is excellent for protection against underground corrosion. Pittsburgh Coke and Chemical Co.



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Ceratok 155, 165 minimum melting point
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C W Report

displaying a minimum of warping and crazing. Available commercially. Barrett Div., Allied Chemical and Dye Corp.

"PLASKON" POLYESTER RESIN 9600

Flexible type polyester suitable for blending with rigid resins. Typical properties: viscosity @ 25°C, 10 poise; Sp. G. @ 25°C, 1.05; color (Hazen), max, 150; stability in dark @ 70°F, uncatalyzed, 4 months, catalyzed, 1 week. Blends provide products with improved impact strength, gel coats free of cracking or crazing, or cast objects that can be made on a shortened cycle. Available in commercial quantities. Barrett Div., Allied Chemical and Dye Corp.

"PLASKON" UREA MOLDINGS COM- POUND, HOUSING-TYPE

A thermosetting molding material formulated from urea formaldehyde resin containing cellulose filler. Improved molding properties have been incorporated to produce a colored urea material for molding television cabinets weighing up to 32 pounds. Further, cross section thickness of $\frac{1}{2}$ " to 1" is now possible in molded parts of urea compared to previous limitations of approximately $\frac{1}{4}$ " to $\frac{1}{2}$ ". The Housing-Type material may be produced in all colors. Commercially available. Barrett Div., Allied Chemical and Dye Corp.

PLASTICIZER FOR PVAC—PYCAL* 94

Polyglycol aryl ether type of product. Imparts high degree of permanent tack to polyvinyl acetate adhesives, high scrub resistance to polyvinyl acetate interior paints. Also compatible with cellulose acetate. Form, mobile liquid; color, almost water white; Sp. G. 25°/25°C, 1.119; R.I. 25°C, 1.502; visc. 25°C, 50-60 cps; M.P., below -40°C.; completely water soluble. Commercially available. Atlas Powder Co.

PLASTICIZER FOR PVC—PYCAL* 170

An auxiliary low cost plasticizer of the aryl ether ester type, for polyvinyl chloride, with excellent low temperature flexibility and low volatility. Also compatible with cellulose nitrate and cellulose acetate butyrate. Form, mobile liquid; Color, Haze 1-7 max.; Sp. G. 25°/25°C, 0.943; R.I. 25°C, 1.484; visc. 25°C, 33 cps; M.P.—Partial solidification below 10°C.; complete solidification 2°C. Commercially available. Atlas Powder Co.

PLASTICIZER FOR PVAC—PYCAL* 194

Polyglycol aryl ether type of product. Similar to Pycal 94 in general properties. Somewhat lower in cost, not quite as efficient plasticizer. Form, mobile liquid; color, pale yellow; Sp. G. 25°/25°C, 1.092; R.I. 25°C, 1.503; visc. 25°C, 50-60 cps; M.P. below -40°C.; partially water soluble. Commercially available. Atlas Powder Co.

PLASTICONE RED LAKE D-3083

A 20% lake of Parazolone Red. Sp. G., 2.35. Bulking value 0.05107 gal. per lb. Suggested uses: floor coverings and plastics. Commercially available. Pigment, Color and Chemical Div., The Sherwin-Williams Co.

PLIOLITE S7-30

An improved paper coating, Pliolite S7-30, is now available in commercial quantities from the Goodyear Chemical Division. A high styrene type copolymer, Pliolite S7 is supplied as a 30% solution in toluene. It is considered a "natural" for application to glassine papers. Other important uses include film and foil lamination and general purpose paper coating. Pliolite S7 forms a clear, flexible film of unusual toughness and gloss. It is capable of substantial modification with a number of materials. Stocks coated with a modified Pliolite S7 coating exhibit excellent resistance to moisture-vapor. Folding has a minimum effect upon this resistance. On a cost basis Pliolite S7 exhibits perhaps the lowest MVTR of any paper coating currently available. Based on a single solvent, these new coatings permit more economical recovery of the solvent. Availability: Commercial. Goodyear Chemical Div.

POLYAMINE 333

A semi-refined mixture of approximately equal proportions of diethylene triamine, triethylene tetramine and tetraethylene pentamine; combining weight to pH of 2.0, approx. 34; Sp. G., 0.9837 at 20°C; EDA plus water (by Dean Stark Method), less than 2%; boiling range, first drop 210°C, 50% over at 250°C; color, amber to dark amber, free of suspended solids. Chemical properties: This product has several reactive amine groups which exhibit the usual reactions with fatty acids and other acidic materials to form soaps which may be further processed to amides, etc. Suggested uses: In the synthesis of asphalt additives, corrosion inhibitors, emulsifiers, emulsion breakers, wetting agents, as catalyst activators in the emulsion polymerization of GR-S type synthetic rubbers, and as a modifying agent in textile

resins. Commercially available. Olin Mathieson Chemical Corp., Industrial Chemicals Div.

POLYCO 509

A 40% solids acrylic copolymer solution polymerized in toluol. Deposits clear, non-yellowing, water resistant films. Uses: protective and decorative coatings, lacquers, aerosol spray dispensers. Commercially available. American Polymer Co.

POLYCO 522

A 55% solids fine particle type of polyvinyl acetate emulsion in a stable, nonionic emulsifier system. Develops films with excellent water resistance. Uses: paint formulations, non-discoloring coatings. Commercially available. American Polymer Co.

POLYCO 558

A 47% solids butadiene-styrene (40:60) latex. Freeze thaw stable and compatible with alkyd resins. Uses: water base paint vehicle. Commercially available. American Polymer Co.

POLYCO 563

A 40% solids stable aqueous dispersion of butadiene copolymerized with acrylonitrile. Yields a flexible non-oxidizing, oil resistant film. Uses: Coatings and saturants for leather, paper, textiles. Commercially available. American Polymer Co.

POLYCO 568

A 50% solids plasticized vinyl chloride water dispersion. Forms clear, flexible films upon drying. Uses: protective and decorative coatings. Saturant for non-woven fabrics. Commercially available. American Polymer Co.

POLYCO 577

A 55% solids fine particle size polyvinyl acetate emulsion in water. Excellent water resistance, freeze thaw stability and adhesion to a wide variety of surfaces. Commercially available. American Polymer Co.

POLYCO A-215

A 40% solids acrylic emulsion with excellent mechanical stability, high pigment binding and high gloss characteristics. Uses: pigment binder for leather finishes, leather sealer, renovating shoe finishes. Commercially available. American Polymer Co.

POLYESTER RESIN—ATLAC® F.P.

A solid, flame resistant polyester; Acid No. 31-37, Softening point 97-99°C.; Particle size — 40 mesh; designed for use with coreactive monomers in the preparation of reinforced plastics requiring flame resistant qualities, in addition to the normal requirements for this type of product. The flame resistant qualities of this resin are due to its chemical composition and not to additives, normally used to obtain this quality. Commercially available. Atlas Powder Co.

POLYESTER RESIN—ATLAC® 363

A solid polyester of fumaric acid and a bis (hydroxy ethyl) ether of bisphenol. Acid No. 12-20; Softening point 110-125°C.; Particle size — 40 mesh; designed especially for use in bonding glass fibers into mats or preforms having controlled solubility in laminating resins. ATLAC 363 is commercially available with or without catalyst and antiblocking agent. Atlas Powder Co.

POLYESTER RESINS—ATLAC® 382

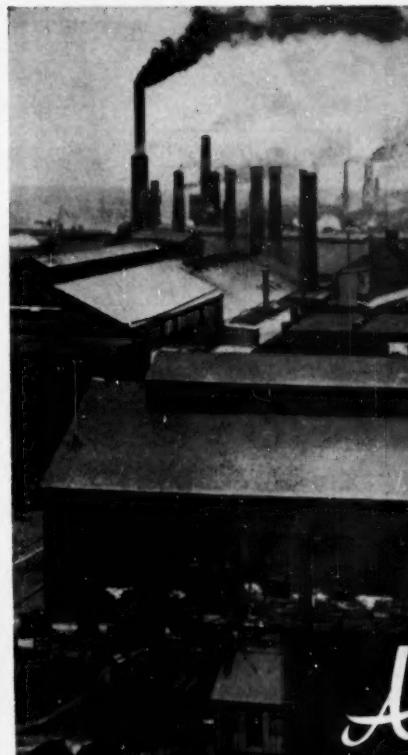
A solid polyester of fumaric acid and a bis (hydroxy propyl) ether of bisphenol. Acid No. 25 max.; Softening point 95-105°C.; Particle size — 40 mesh; designed for use with styrene or other coreactive monomers in all reinforced plastics but especially attractive in the production of "prepreg" cloth, fully loaded mat, premix molding compounds, or applications requiring low shrinkage, high heat distortion or chemical resistance. Commercially available. Atlas Powder Co.

POLYETHYLENE GLYCOL STEARATES 25

High melting grades; white to cream waxy solids; practically odorless. Impart additional heat resistance and opacity to cosmetic creams and lotions at elevated temperatures. Available in mono- and diesters of Polyethylene Glycols 200 to 1000. Commercially available. Kessier Chemical Co., Inc.

POLYGLYCOL P-250—HO(C₂H₄O)₃₋₅H

M.W. 250; Viscosity at 100°F., centistokes, 25.0-27.8; Flash point, 335°F; Fire point, 340°F; Color, APHA, max., 200; Ash, max., 0.02%; Acidity (as HCl), max., 0.05%; Alkalinity (as KOH), max., 0.05%; Solution—10 cc dissolved in 100 cc CCl₄ shall give a clear solution. Used as a hydraulic fluid component. Commercially available. Dow Chemical Co.



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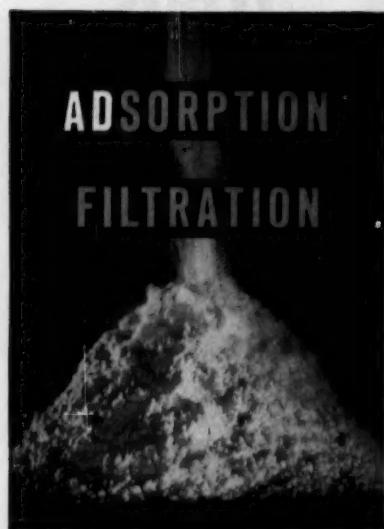
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C W Report

POLYGLYCOL P-3000

Pour point, -29°C.; Sp. G. at 25/25, 1.001; R. I. at 25°C., 1.449; Flash point, 440°F.; Fire point, 510°F.; Viscosity at 100°F., centistokes, 300—375; Ash, max., 0.02%; Acidity as HCl, max., 0.05%; Basicity as KOH, max., 0.05%; Color APHA, max., 200; Sol. requirement — 10 cc dissolved in 100 cc CCl₄ gives a clear solution. Commercially available. Dow Chemical Co.

POLYGLYCOL P-4000

Pour point, -29°C.; Sp. G. at 25/25, 1.001; R. I. at 25°C., 1.449; Flash point, 440°F.; Fire point, 510°F.; Viscosity at 100°F., centistokes, 500—575 ccs.; Ash, max., 0.02%; Acidity as HCl, max., 0.05%; Basicity as KOH, max., 0.05%; Color APHA, max., 200; Sol. requirement — 10 cc dissolved in 100 cc CCl₄ gives a clear solution. Commercially available. Dow Chemical Co.

POLYGLYCOLAMINE H-163

HOCH₂CH₂OCH₂CH₂OCH₂CH₂NH₂, M.W., 163.2; Sp.G., 0.956 at 20°/20°C.; B.P., 278°C. (760 mm.); sol. in water, complete at 25°C.; completely miscible with acetone, benzene, carbon tetrachloride, and methanol at 25°C.; odor, ethereal and slightly ammoniacal; color, water white. Chemical properties: Primary amino alcohol containing ether linkages. Suggested uses: Preparation of amides of fatty acids for use as organic builders for detergents; preparation of emulsifying agents and dispersants for pigments, dyes, and emulsion polymers; starting material for pharmaceutical syntheses. Availability: commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

BAKER'S® POLYHYDROXY STEARIC ACID

Polyhydroxy Stearic Acid, M.W., 331, Tan, waxy solid, Color, Gardner (Melted), 16; Viscosity, %, 0.7; Melting Point, °C., 60-64; Acid Value, 170; Iodine Value, 4; Sap. Value, 181; Hydroxyl Value, 270; Insoluble in water. Soluble in most organic solvents. Availability: pilot plant. The Baker Castor Oil Co. Commercial Development Division.

POLYMETHOXY ACETAL-5

CH₃(CH₂)_nCH(OCH₃)₂, Sp.G. 25°/4°C OCH₃

0.978, R.I. 25°C., 1.440. Pour point —48°C., B.P. (initial) 140°C. Clear yellow liquid with an ethereal odor. Slightly soluble in water, completely soluble in ethyl ether, ethyl alcohol, acetone, aniline, benzene, kerosene, dimethylformamide. Compatible with water insoluble plasticizers such as dibutyl phthalate, tricresyl phosphate, butyl cellosolve stearate. Suggested uses: Plasticizer and softener in adhesive coatings and inks; selective solvent; modifier for phenolics and other resins; pick up agents in continuous shell molding. Availability: Pilot plant quantities. General Aniline & Film Corp.

POLYMETHOXY ACETAL-10

CH₃(CH₂)_nCH(OCH₃)₂, Sp.G. 25°/4°C OCH₃

1.015, R.I. 25°C., 1.453. Pour point —15°C., B.P. (initial) 220°C. Hazy yellow liquid with an ethereal odor. Slightly soluble in water, completely soluble in ethyl ether, ethyl alcohol, acetone, aniline, benzene, kerosene, dimethylformamide. Compatible with water insoluble plasticizers such as dibutyl phthalate, tricresyl phosphate, butyl cellosolve stearate. Suggested uses: Plasticizer and softener in adhesive coatings and inks; selective solvent; modifier for phenolics and other resins; pick up agents in continuous shell molding. Availability: Pilot plant quantities. General Aniline & Film Corp.

POLYMETHOXY ACETAL-15

CH₃(CH₂)_nCH(OCH₃)₂, Sp.G. 25°/4°C OCH₃

1.021, R.I. 25°C., 1.456. Pour point —11°C., B.P. (initial) 230°C. Hazy yellow liquid with an

ethereal odor. Slightly soluble in water, completely soluble in ethyl ether, ethyl alcohol, acetone, aniline, benzene, kerosene, dimethylformamide. Compatible with water insoluble plasticizers such as dibutyl phthalate, tricresyl phosphate, butyl cellosolve stearate. Suggested uses: Plasticizer and softener in adhesive coatings and inks; selective solvent; modifier for phenolics and other resins; pick up agents in continuous shell molding. Availability: Pilot plant quantities. General Aniline & Film Corp.

POLYVINYLPYRROLIDONE

Density 1.23 to 1.29 g/ml. Viscosity range K 20 to 90 (Fikentscher), a white amorphous powder readily soluble in water, chlorinated hydrocarbons, alcohols, amines, nitroparaffins and lower molecular weight fatty acids. Compatible in films of cellulose acetate, polyacrylonitrile, shellac, polyesters. Physiologically compatible, exercises protective colloidal action, has complexing properties with drugs, toxins and dyestuffs. Suggested uses: Blood volume expander, drug retardant, suspending agent, component in cosmetic formulations including hair fixatives, shampoos, shave-creams, skin lotions and dentifrices, dye stripping agent, textile finish. Also in lithography, food, agricultural products. Availability: Commercial quantities. General Aniline & Film Corp.

POTASSIUM METHYL SULFATE TECHNICAL

Potassium methyl sulfate content 90% min. Potassium sulfate 0.5% max.; pale yellowish-white powder; freely soluble in water, usually leaving a slight residue; pH of 1:10 aqueous solution approx. 10. Availability: Experimental quantities immediately available; larger supplies readily arranged. New York Quinine and Chemical Works.

POTASSIUM TETRAETHIONATE

K₂S₄O₆, M.W. 302.44, monoclinic crystals. Sp. G. 2.296. Sol. Water. Uses: Specialized reducing agent. Used in bacteriology as a component of certain culture media. Availability: Pilot plant quantities. Eastern Chemical Corp.

PROPARGYL ALCOHOL (2-PROPYN-1-OL)

HC=CHCH₂OH, MW 56.06, Sp. G. 20°/4°C 0.948, M.P. —52°C., B.P. 115°C., RI 1.429. Clear colorless to light straw colored liquid with a mild geranium-like odor. Completely soluble in water, benzene, and chloroform. Chemical properties: Has three centers of reactivity: The hydroxyl group undergoes characteristic reactions of primary alcohols; the triple bond gives addition reactions, and the acetylenic hydrogen also reacts. Suggested uses: Intermediate in the preparation of pharmaceuticals, agricultural chemicals, textile auxiliaries. Corrosion inhibitor and stabilizer. Availability: Semi-commercial quantities. General Aniline & Film Corp.

PROPARGYL BROMINE (3-BROMO-1-PROPYNE)

HC=CH₂Br, M.W. 118.97, Sp. G. 25°/25°C 1.564, F.P. —61.1°C., B.P. (766 mm.) 83.8°C., R.I. 1.4902. Almost colorless liquid with a sharp odor; insoluble in water, soluble in ethers, benzene and hydrocarbons. Chemical properties: Has three centers of reactivity and thus can react at the active bromine atom, at the triple bond, and at the acetylene hydrogen. Suggested uses: Intermediate in the preparation of terpenes and pharmaceuticals. Agricultural use as soil fumigant. Availability: Semi-commercial quantities. General Aniline & Film Corp.

DI-n-PROPYLAMINE

(CH₃CH₂CH₂)_nNH, M.W., 101.2; Sp.G. 0.74 at 20°/20°C.; Color, water white; Dipropylamine content, 98%; I.B.P., 105°C.; F.B.P., 112°C.; Flash Point (open cup), 45°F. Suggested as an intermediate for pharmaceuticals and other organic chemicals. Available in semi-commercial quantities from Sharples Chemicals Inc.

PYROSET FIRE RETARDANT SF

A modified resin. A water soluble, colorless, clear syrup. Primarily used as a flame retardant and finishing agent for nylon. Should be used with Aerotex Accelerator NF for best results. Commercially available. American Cyanamid Co., Organic Chemicals Div., Textile Resins Dept.

PYRROLE

(CH₃)₂NH, 67.09; colorless liquid when freshly prepared or distilled, darkens on standing; B.P. 128-129°C. (262-264°F.); F.P. —24°C. (-11°F.); flash point (Tag closed cup) 39°C. (102°F.). Solubility in water at 25°C., 6g./100g.; solubility of water in pyrrole at 25°C., 3g./100g.; miscible with most organic solvents, partially soluble in glycerine, petroleum ether, heptane, and isoctane. Suggested uses: specialized solvent and chemical intermediate. Reacts by reduction, substitution, condensation, ring expansion and splitting of the ring. Available in semi-commercial quantities. Electrochemicals Dept., E. I. duPont de Nemours & Co.

PYRROLIDINE

$(\text{CH}_2)_4\text{NH}$, M.W., 71.12, colorless, mobile liquid; B.P., 86-87°C. (187-189°F.); F.P. -63°C. (-81°F.); flash point (Tag closed cup) 3°C. (37°F.). Miscible with water, forming a strongly alkaline solution; miscible with most organic solvents. Undergoes variety of addition, condensation, acylation, and alkylation reactions. Suggested uses: preparation of pharmaceuticals, insecticides, and accelerators for rubber vulcanization. Available in semi-commercial quantities. Electrochemicals Dept., E. I. duPont de Nemours & Co.

2-PYRROLIDONE

$\text{CH}_3\text{CH}(\text{CH}_2)\text{CONH}$, M.W. 85.10, Sp. G. 25°C, 1.107, M.P. 25°C, B.P. 245°C, R.I. 1.486. Colorless liquid or crystalline solid. Very soluble in water, ethyl alcohol, ether, benzene and carbon disulfide. Chemical properties: Polymerizes to high molecular weight, linear polyamide condensation product; hydrolyzes to γ -aminobutyric acid. Reacts with acid anhydrides, formaldehyde, ethylene oxide. Suggested uses: Chemical intermediate and solvent. Availability: Semi-commercial quantities. General Aniline and Film Corp.

QUADROL (N,N,N',N'-TETRAKIS(2-HYDROXYPROPYL)ETHYLENEDIAMINE

$\text{HO}-\text{CH}(\text{CH}_2)-\text{CH}_2-\text{N}-\text{CH}_2-$
 $\text{HO}-\text{CH}(\text{CH}_2)-\text{CH}_2/\text{CH}_2-\text{CH}(\text{CH}_2)-\text{OH}$
 $\text{CH}_2-\text{N}/\text{CH}_2-\text{CH}(\text{CH}_2)-\text{OH}$
 $\text{C}_{14}\text{H}_{32}\text{N}_2\text{O}_4$, M.W. 292; Sp. G. 1.033 at 25°C/25°C; R.I. 1.478 at 25°C; B.P. 225°C (5mm); Form, waterwhite viscous liquid; odor, none. Typical analysis, tertiary amine assay, 99%. Chemical Properties: Compound contains six chemically reactive centers — 4 hydroxyl groups, 2 tertiary nitrogens. Reactions with monobasic organic acids gives corresponding mono-, di-, tri-, or tetraesters; poly basic organic acids give resins; di-isocyanates give poly urethanes. The tertiary nitrogen is open for quaternization or inorganic salt formation. Suggested uses: By itself Quadrol has potential as a humectant and a plasticizer. As an intermediate Quadrol has wide use in the preparation of various resins, emulsifying agents, surface active agents, pharmaceuticals and other organic chemicals. Availability: Pilot Plant quantities. Wyandotte Chemicals Corp.

QUININIC ACID

$\text{C}_{11}\text{H}_{19}\text{O}_3\text{N}$; M.W. 202.07; a tan to pale yellow powder containing not less than 98.5% quininic acid by titration; M.P. approx. 280°C with decom.; M.P. of the picrate 198-199°C; sulfated ash 0.02% max.; loss on drying 4 hr. at 1 mm. and 100°C no more than 1% of its weight. Availability: Experimental quantities immediately available; larger supplies readily arranged. New York Quinine and Chemical Works.

RAYDEX

Mildly alkaline manual cleanser in powdered form for use in dairies and all food processing plants. Applied in water solution by brush or spray method in cleaning food handling equipment, walls, floors, etc. Cleans rapidly, softens water, produces copious suds which are easily rinsed off. Contains no insoluble matter or abrasives. Packed in 100-lb. polyethylene lined paper bags. Commercially available through B-K Dept., Pennsylvania Salt Mfg. Co.

G-E 12316 RESIN

This is a powdered, two-stage phenolin resin excellently suited for rapid, economical bonding of shell molds. It is also used as a dry parting agent and as a dry core binder on special cores. The resin is amber to white in color. It has a softening point of 110-125°C, and a stroke cure at 150°C. of 80-100 sec. Other properties: Hexa content, low. Screen analysis, 94 per cent through 140 mesh. Storage life, in closed containers, 6-12 months at 70°F. Commercially available. General Electric Co.

G-E 12361 RESIN

A finely powdered, two-stage phenolic (formaldehyde) resin which, when mixed with sand, performs well over a wide variety of shell casting applications. Its properties are such that it is best suited for intricate patterns with deep draw and little or no draft. It has good buildup characteristics and is well suited for shell core applications. It has no tendency of peeling in the green or semi-cured state, and its release properties are excellent with no tendency of binding. It has a medium cure, medium-soft flow, medium-high softening point and particle size is 99% through 200-mesh screen. Commercially available. General Electric Co.

G-E 12374 RESIN

A finely powdered, two-stage phenol formaldehyde resin which, when mixed with sand, performs

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AND DRUMS**

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is held to the absolute

minimum due to the high strength and long life of steel and the perfected liquid-tight construction. Spoilage from within just can't happen—when the material is any one of the wide variety of chemical and food products to which Republic long-lived lacquer linings are absolutely neutral. Here's double protection for your product. And here are other important reasons why it will pay you to standardize on Republic . . .

★ Choice of gauges to meet all handling and shipping requirements.

★ Full range of sizes up to 55-gallon size.

★ Standard bung openings in head or body.

★ Sturdy leak-proof construction based on "know-how" of more than 30 years of container service to the chemical industry.

Lower Maintenance Costs with Barrels and Drums of ENDURO® Stainless Steel

Cost of container maintenance is trimmed by ENDURO—the lustrous metal that resists corrosion, and hard use and abuse—never needs painting—lasts indefinitely. ENDURO offers greater safety, too—inert to most chemical and food products.

REMOVABLE HEAD OR TIGHT HEAD

Quicklox removable head drum shown above and tight head drum at right are but two of many styles available in the complete Republic line.



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DEODALL #1, Sindar's new multi-purpose masking agent, replaces objectionable odors in varnishes, lacquers, cleaners, polishes, oils and other products with a fresh, clean scent that promotes sales, good will. Also solves stack odor problems effectively, economically. Ask Sindar for full facts.

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C W Report

well over a variety of shell casting applications. Its properties are such that it is best suited for production requirements since it is fast curing and has a rigid set on ejection, thereby minimizing shell warpage. It fills intricate areas well and has good build-up characteristics. It has no tendency of peeling in the green or semi-cured state. In addition its excellent "hot rigidity" properties minimize any sagging tendency in the mold when the molten metal is poured. It has fast cure, medium flow, medium-high softening point and a particle size of 99% through 200-mesh screen. Commercially available. General Electric Co.

RESIN EMULSION TACKIFIERS ARCCOS A 25 AND A 26

These resin emulsions are designed for use with natural latex in the manufacture of fast-breaking (fast-setting) adhesives. Typical applications are side lasting and sock lining cements in the shoe industry. Carton adhesives and other uses where instantaneous grab is required. A high degree of emulsion stability is obtained without sacrifice of fast-breaking properties. Commercially available. American Resinous Chemicals Corp.

RHOZYME MH

Liquid diastatic desizing agent for starch sizes. Heat stable and, therefore, has wide range of application. Commercially available. Rohm & Haas Co.

RIBOFLAVIN-5'-PHOSPHATE SODIUM

$C_{17} H_{20} N_4 O_9 P Na \cdot 2H_2O$. M.W. 514.4. Also known as vitamin B₂ phosphate sodium salt and flavin mononucleotide (F.M.N., a constituent of the yellow enzyme). Yellow powder; synthetically prepared, stable, water-soluble ester of riboflavin (vitamin B₂). Water solubility is between 4% and 11%, (depending on pH of solution), as compared to 0.012% for riboflavin. Completely active biologically, microbiologically, and enzymatically, on a molar basis. On a weight basis, activity is 70-73% of riboflavin (M.W. 376.4). Suggested uses: Preparation of (multi-) vitamin solutions (for both oral and parenteral use) where a higher concentration of vitamin B₂ is desired than attainable with riboflavin alone. Also for oral vitamin formulation where the less bitter taste of the ester may be advantageous. Commercially available. Hoffman-La Roche, Inc.

RICINOLEYL ALCOHOL—"ADOL 40"

Typical Specifications: Approx. 89% Unsaturated Diol, Avg. Chain Length C₁₈. Hydroxyl groups located in terminal position and 12th carbon atom. Double bond 9:10 position. M.W. 282.6; Cloud Pt. below 10° F.; Viscosity, SSU/210° F. 51; I. V., 92; Sap. Val., .84; Hydroxyl Val., 361.0; Fire Point, 435° F.; Suggested Uses: Polyesters, Plasticizers, Intermediates, Lubricants, Protective Coatings and Surfactants. Availability: Commercial. Archer-Daniels-Midland Co.

RS-1322 PLASTICIZER

A pre-stabilized plasticizer, oily-liquid, light color, high boiling with excellent low temperature properties. Suggested uses: In combination with Geon 121 (Goodrich) resin and BL-353 (DuPont) blowing agent RS-1322 plasticizer produces a plastic which when properly cured makes a very high quality free-blown vinyl sponge. Ohio-Apex Div., Food Machinery and Chemical Corp.

RTV SILASTIC

Can be easily vulcanized at room temperature. Good physical and electrical properties suggest use of RTV Silastic as a caulking or sealing material, as a potting compound for electrical assemblies and electronic units, as a flexible mold material, and as a cloth coating dope. No high temperature cure is necessary; RTV Silastic will set up to a stable, resilient mass without addition of heat. Dow Corning Corp.

SINCLAIR OIL SOLUBLE RUST INHIBITOR.

RD-155

Sp. G., 60/60° F = 0.8849; Flash Point, 135° F.

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KP - 140

OHIO-APEX DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
NITRO, WEST VIRGINIA

Viscosity SUS @ 100° F = 56.4. Sinclair RD-155 is a hydrocarbon soluble polar type rust inhibitor. Its addition to hydrocarbons and distillate fuels protects all hydrocarbon washed ferrous metal surfaces from the ravages of rust caused by water and air. The anti-rust property of this inhibitor is chiefly due to its ability to adsorb on metal surfaces in a monomolecular film. As little as 10-20 parts per million in hydrocarbons provides adequate protection to facilities such as pipe lines, tanks and vessels in which products containing this inhibitor are transported or stored. Available in commercial quantities. Sinclair Chemicals, Inc.

SANTOCEL 54

A finely divided silica aerogel; fluffy white powder with bulk density of 4.5 lbs. per cu. ft. Ultimate particle size 20-40 micrometers formed into aggregates average size 0.5-3 microns. Refractive index 1.46. Used for flattening lacquers and varnishes and thickening polyester solutions. Available in commercial quantities. Monsanto Chemical Co., Inorganic Chemicals Div.

SARCOSINE ACID N-METHYLGlycine

$C_5H_7NO_2$, M.W. 89.09. Yellowish, hygroscopic crystals. M.P. 205° C. Very soluble in water, slightly soluble in alcohol. Chemical properties: Alcoyl Sarcosinates are readily prepared. Suggested uses: In the synthesis of surface-active and enzyme-inhibiting chemicals. Availability: Experimental quantities. Chemo Puro Mfg. Corp.

SEQUESTERING AGENT—ATLAS G-3360

An organic sequestering agent of the substituted amino acid type. Supplied as a 50% active ingredient solution in water, Sp. Gr. 1.29; pH of 1% solution 6.5-7.0, color—pale straw. Especially designed for sequestering heavy metal ions, not recommended for sequestering alkaline earth metals. Effective in pH range from 6.0 to strong caustic solutions. Availability: Pilot Plant quantities. Atlas Powder Co.

DL SERINE— $C_3H_7NO_3$

M.W. 105.1; M.P. 243 to 244° C.; Assay: by amino group determination (perchloric acid method), 99-101%; by carboxyl group determination (formol titration), 99-101%; loss on drying (4 hrs. at 105° C.), max., 0.10%; Ash (sulfated), max., 0.10%. Chloride (as Cl), max. 0.16%; Iron, max., 20 ppm; Heavy metals (as Pb), max. 20 ppm; A solution of 5 g. in 50 ml. N/1 NaOH has: an APHA color, max. 40; A turbidity less than that given by 0.4 mg. BaSO₄ in 50 ml. solution. Amino acid. Commercially available. Dow Chemical Co.

SM-70 SILICONE EMULSION

A thin, invisible surface film of SM-70 will reduce breakage and scratching of glass while imparting water repellency, lubricity without oiliness, release properties and improved appearance. It is also a superior mold release agent for the glass industry since it eliminates the fire hazard, reduces maintenance in cleaning molds and results in less rejects. SM-70 is a 50% oil in water emulsion of a curable methyl silicone fluid polymer that can be diluted to working concentrations by the addition of water. It can be applied by spray, brush or dip. Commercially available. General Electric Co.

SE-30 SILICONE GUM

A clear, water-white silicone polymer which has been developed for compounding silicone rubber stocks which will have extremely low compression set characteristics, low shrinkage and improved heat stability without sacrifice of the other outstanding silicone rubber properties. Compounds may be made from SE-30 silicone polymer for molding, extrusion, calendering and knife or dip coating processes. Commercially available. General Electric Co.

SE-51 SILICONE GUM

A clear, light-amber to colorless silicone polymer which has been developed for compounding silicone rubber stocks which will remain flexible at extreme low temperatures without sacrifice of other outstanding silicone rubber properties. Compounds may be made from SE-51 silicone polymer for molding, extrusion, calendering and knife or dip coating processes. Commercially available. General Electric Co.

SR-111 SILICONE RESIN

Designed especially for use as a vehicle in formulating heat and weather-resistant protective coatings, SR-111 is supplied as a 50% silicone resin in toluene. It combines outstanding heat resistance with an unusual balance of flexibility, hardness and curing speed. SR-111 is ideal for both aluminum and colored protective coatings for such items as exhaust manifolds, stacks, jet engine parts, ovens, space heaters and incinerators. Commercially available. General Electric Co.

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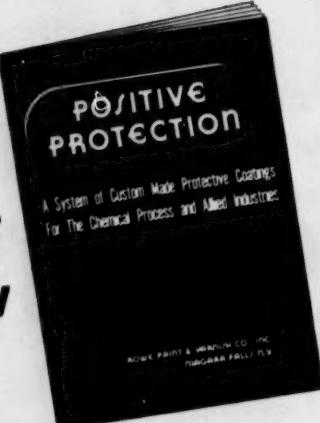
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C W Report

CLASS 300 SERIES SILICONE RUBBER

The ultimate in low compression set and low shrinkage makes the Class 300 series a superior compound for fabricating seals, gaskets and other rubber parts which must stand up under the most severe service conditions. Class 300 series silicone rubber can be molded, extruded or calendered and is commercially available in 60, 70 and 80 durometer stocks. General Electric Co.

SILICONE RUBBER—GLASS CLOTH

Very flexible high temperature insulation composed of silicone rubber on various glass cloths. Combines the very high tensile strength of glass cloth with the excellent dielectric and chemical resistance of silicone rubber. Available in regular weave and bias cloth. The latter gives excellent extensibility so that it snags down tightly on irregularly shaped connections. A partially cured type is available which cures in place to give a very tightly bonded insulation. Commercially available in thicknesses of 0.007", 0.010", 0.012", 0.015", 0.020". General Electric Co.

SILICONE T-773

Tin octoate: $\text{Sn}(\text{C}_7\text{H}_{15}\text{COO})_2$ M.W. 404.7, Specific Gravity 1.26. Pale amber viscous liquid soluble in aliphatic and aromatic hydrocarbon solvents. Contains 28% Sn. Suggested uses: catalyst in the curing of silicone resins; anti-oxidant; stabilizer for transformer oils. Commercially available. Nuodex Products Co., Inc.

SILICURE Z-775

Solid specially formulated zinc octoate containing 22% zinc, Sp.G., 1.16. Light straw colored viscous liquid, insoluble in water, soluble in common organic hydrocarbon solvents. Suggested uses: catalyst in curing of silicone resins. Commercially available. Nuodex Products Co., Inc.

SODIUM ACID p-SULFOBENZOATE p-CARBOXYBENZENESULFONIC ACID, SODIUM SALT

$\text{C}_6\text{H}_4\text{SO}_3\text{HCOONa}$. M.W. 224; white granules; purity on free acid basis (M.W. 202) : min. 78%; sodium sulfate content (as is) : max. 12%. Used as a pharmaceutical intermediate. Available on commercial scale. Antara Chemicals, a Sales Division of General Aniline & Film Corp.

SODIUM 1-AMINO-4-BROMO-2-ANTRAQUINONESULFONATE (BROMAMINE ACID)

$\text{C}_14\text{H}_8\text{NO}_2\text{Na}_2\text{SO}_3\text{NaBr}$. M.W. 394; brick-red colored paste; average purity, as the free acid (M.W. 382) : 90-93% on dry basis, approx. 40-50% on wet basis; by diazotization. Suggested uses: Dyestuff intermediate, organic synthesis. Available in commercial quantities. Antara Chemicals, a Sales Division of General Aniline & Film Corp.

SODIUM ASPARAGINATE: SODIUM ASPARTATE, SODIUM AMINO-SUCCINATE

$\text{C}_4\text{H}_6\text{NO}_4\text{Na}$ m.w. 155.1 White crystals. Soluble in water. Grades: Technical, C.P. Availability: Laboratory scale. City Chemical Corp.

SODIUM DITHIONATE (SODIUM HYPOSULFITE)

$\text{Na}_2\text{S}_2\text{O}_6 \cdot 2\text{H}_2\text{O}$. Colorless rhombic crystals. M.W. 242.15. Sp. G. 2.189. V.sol. Water.—Insol. Alcohol and other organic solvents. Uses: Specialized reducing agent. Used in bacteriology as a component of certain culture media. Availability: Pilot Plant Quantities. Eastern Chemical Corp.

SODIUM HYDROXYSTEARATE

$\text{C}_{18}\text{H}_{34}\text{O}_3\text{Na}$ M.W. 322.3 White powder. Slightly soluble in cold water, readily in hot water. Grades: Technical, purified. Availability: pilot-plant scale. City Chemical Corporation.

SODIUM META-NITROBENZENE-SULFONATE

$m\text{-NO}_2\text{C}_6\text{H}_4\text{SO}_3\text{Na}$ M.W. 225 Assay 70% min. Moisture 21% max. Acidity as H_2SO_4 — 7% max. Sulfates as Na_2SO_4 — 2% max. Avail-

ORGANIC PEROXIDES

LUPERSOL^{*} DDM

60% METHYL ETHYL KETONE PEROXIDE
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ability: commercial quantities. Monsanto Chemical Co., Organic Chemicals Div.

SODIUM TETRA-PHENYL-BORON

$\text{NaB}(\text{C}_6\text{H}_5)_4$. A new reagent for the gravimetric and volumetric determination of potassium, ammonium and certain organic nitrogen compounds. It is of particular value in the analysis of pharmaceutical and fertilizer substances. Literature pertaining to this reagent available upon request. J. T. Baker Chemical Co.

SODIUM ZINC CHROMATE, BASIC. TECHNICAL

$\text{Na}_2\text{O} \cdot 4\text{ZnO} \cdot 4\text{CrO}_3 \cdot 3\text{H}_2\text{O}$. M.W. 841.60. Incongruously soluble with hydrolysis occurring slowly. Bright yellow crystalline powder. Somewhat more readily soluble but otherwise generally similar to analog, potassium zinc chromate, basic, commonly called Zinc Yellow. Suggested Uses. Inhibitive paints, preservative impregnant for wood and paper products or cordage, limited solubility corrosion inhibitor and algicide, anti-corrosive fungicide component, pigment and stabilizer for plastics. Available in pilot plant quantities. Mutual Chemical Co. of America, Research and Development Div.

SOFTENER R

Cationic softening agent developed specifically for cotton, rayon and wool fibers where lubricity, soft feel and higher tear strength are required. Has 50% active ingredient, readily water soluble. pH of 1% solution is 4.7. Commercially available. Rohm & Haas Co.

SOLFAS RED, CP 1257

High strength B-O-N Red with good resistance to water bleed. Sp. G., 1.57. Bulking value 0.07645 gal. per lb. Oil absorption 48. Suggested uses: printing inks. Commercially available. Pigment, Color and Chemical Div., The Sherwin-Williams Co.

WITCO STAYRITE #229

A new basic lead salt developed for the stabilization of halogen containing organic materials. White powder, Sp. G., 5.9, refractive index 2.0, and litharge content 88%. High reactive lead oxide content makes it particularly suitable as a heat stabilizer for opaque polyvinyl chloride compositions. Witco Chemical Co.

PRIMARY STANDARDS

Five Primary Standards are now available—Arsenic Trioxide, Benzoic Acid, Potassium Biphthalite, Potassium Dichromate and Sodium Oxalate. On each label there is an actual lot analysis and assay given. Specifications and literature available upon request. J. T. Baker Chemical Co.

"S-T-R-E-T-C-H" POLYETHYLENE COLOR CONCENTRATE

A completely dispersed concentrate made by intensive compounding of light- and heat-stable pigments in non-toxic polyethylene. Furnished in dust-free, uniform size pellets, packed in 50-lb. multi-ply bags. Used by injection molders and extruders in the proportion of one part S-T-R-E-T-C-H to three or more parts of natural polyethylene, thus saving the molder 5¢ to 15¢ per product pound. Available in bright toy and housewares colors, brown for TV lead-in wire, black for polyethylene pipe. Commercially available. Gering Products Inc.

STRONTIUM SULFATE

SrSO_4 . M.W. 183.7. White, odorless powder. Insoluble in water, slightly soluble in alkali chloride solutions. Suggested uses: As a paint pigment; in pyrotechnics, plating and ceramics. Availability: commercial quantities. Chemo Puro Mfg. Corp.

SUCCINONITRILE

$\text{NCCH}_2\text{CH}_2\text{CN}$. M.W. 80.1; Sp.G. 1.022 at 25° C.; M.P. 57.7°C.; B.P. 198°C. (100 mm.); soluble in water, 9% at 25°C.; colorless waxy solid. Chemical properties: a very reactive aliphatic dinitrile. Of importance as a chemical intermediate and as a selective solvent for aromatics. Semi-commercially available. American Cyanamid Co.

SUCCINYL CHLORIDE (CH_2COCl_2)₂

M.W. 154.99; B.P. 97-100°/30mm.; R.I.²⁰ 1.4663. Reactions are typical of acid chlorides, introducing in this case, the succinyl group without necessity of removing water. Suggested uses: Introduction of succinyl group as in the formation of esters, amides, etc. Availability: Semi-commercial. Arapahoe Chemicals, Inc.

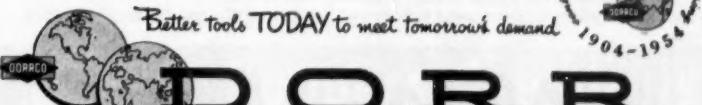
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CYCLONE

Today, the DorrClone—potent new classification tool—is undergoing a physical transformation. Experience has proven that decreasing its diameter increases the fineness of the separation made. Result... the pencil-size TM DorrClone shown above.

These bakelite midgets, nested 32 to a housing, are doing big things in filtrate clarification and fine size classification in the 2 to 20 micron range. Clays, pharmaceuticals, fillers, pigments, talc, grinding compounds—all can be economically processed by these 10 mm TM's or their companion 15 mm units of molded rubber.

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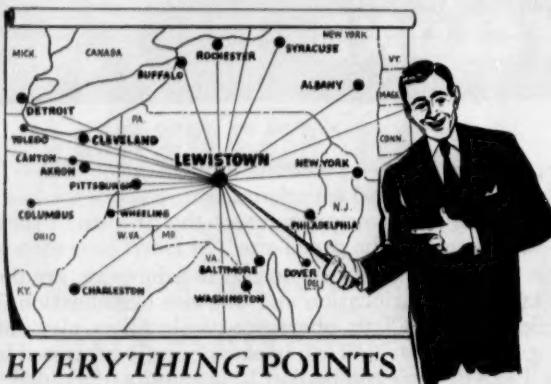
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EARL S. WELLER, President

C W Report

SUCCINYL CHLORIDE



$\text{H}_2\text{C}-\text{COCl}$ M.W. 155. Solidifying Point 15°C. A light brownish-yellow clear liquid, soluble in ether, benzene and carbon disulfide; insoluble in petroleum ether. Suggested for use in the synthesis of pharmaceuticals and organic chemicals. Available in pilot plant quantities. National Aniline Div., Allied Chemical and Dye Corp.

M-SULFOBENZOIC ACID

$\text{m-C}_6\text{H}_4-(\text{COOH})-(\text{SO}_3\text{H})$ M.W. 202.18; M.P. 141°C; hygroscopic tan colored crystalline mass. Very soluble in water, soluble in alcohol and acetone. Chemical Properties: May be esterified with alcohols. Suggested uses: In preparation of surfactants. Availability: Experimental Quantities. Allied Chemical and Dye Corp., General Chemical Div.

SULFOCHLOROACETIC ACID

$\text{CH}(\text{Cl})-(\text{COOH})-(\text{SO}_3\text{H})$ M.W. 174.56; M.P. 70-75°C; hygroscopic tan colored crystalline mass. Very soluble in water, soluble in alcohol and acetone. Chemical Properties: May be esterified with alcohols. Suggested uses: As a catalyst for sulfoacylation. Availability: Experimental quantities. Allied Chemical and Dye Corp., General Chemical Div.

4-SULFOPHTHALIC ACID

$\text{HO}_3\text{SC}_6\text{H}_3-(\text{COOH})_2$ M.W. 246.20. Hygroscopic crystalline solid. M.P., 125°C. Chemical properties: Undergoes reactions typical of phthalic acid. In addition, the sulfonic acid group provides another seat of reaction for salt formation, hydrolysis, replacement by halogen, etc. Suggested uses: Synthesis of soluble phthalocyanine dyes, vat dyestuff intermediates, sulfonated arachinone pigment intermediates, surface active agents, and cation exchange resins. Availability: In commercial quantities as 50% aqueous solution. The Carwin Co.

SULFOPHTHALIC ANHYDRIDE

$\text{HSO}_3\text{C}_6\text{H}_3(\text{CO})_2\text{O}$ M.W. 228.7; Tan resinous solid melting over a range of temperature. Soluble in water (to give 4-sulfophthalic acid), insoluble in hydrocarbons. Chemical Properties: With water gives sulfophthalic acid; easily esterifies with alcohols. Suggested uses: Intermediate for the preparation of tanning agents, dyestuffs, and detergents. Allied Chemical and Dye Corp., General Chemical Div.

SULPHUR (AMORPHOUS MU ALLOTROPE)

$(\text{S})_{\mu}$ M.W., approx 200,000. Sp. G. 2.03. The Mu allotrope of Sulphur (a polymerized metastable form) is insoluble in solvents commonly used for ordinary rhombic Sulphur. In addition, it is quite unreactive and can be combined with some materials without the usual sulfur reactions. Reversion to the rhombic form can be easily accomplished by controlled heating. Suggested uses: for formulation in sulphur-metal or sulphur-resin mixes where delayed or controlled sulphur reactivity is desired. Available as a fine flour in commercial quantities. Analysis: 85% Mu, 15% rhombic sulphur. Stauffer Chemical Co.

SUNOLOX

A proprietary formulation designed to promote the stability of hydrogen peroxide bleach solutions. It is a white, free-flowing, powder with a bulk density of 56.6 pounds per cubic foot. Solubility in 48.1 g/100 ml water at 25°C. insoluble in organic solvents. A 0.1% solution has a pH of 7.5 permitting the bleaching of textiles at almost the neutral point. Sharp reduction in silicate content of conventional peroxide bleach solutions with consequent improvement in the softness of the fabric. Commercially available through Industrial Chemicals Div., Pennsylvania Salt Mfg. Co.

SURFACTANT—ATLAS G-202

A cationic surface active agent. Supplied as 100% active material in form of a soft waxy

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"THE STYRENE MONOMER STORY"

picture of a chemical giant

water soluble material which melts slightly above room temperatures. Suggested uses: Detergent, emulsifier, germicide, anti-static agent, corrosion inhibitor, pigment dispersant. Availability—drum quantities. Atlas Powder Co.

BAKER'S® SURFACTOL 13

A Proprietary Product. Clear, bright, viscous liquid. Density @ 25°C./25°C., 1.006; Color, Gardner, 3; Viscosity, %, 0.7; Iodine Value, 71; Sap. Value, 132; Pour Point °F., 20; Flash Point, COC, °F., 420; Fire Point, COC, °F., 470; Viscosity, G. H. @ 25°C., Z; Viscosity, SUS @ 210°F., 174; Surfactol 13 is a self-emulsifying, non-ionic castor oil derivative which is water insoluble and largely oil insoluble. It is dispersible in water with adequate agitation. Surfactol 13 should be investigated in Emulsion Paint systems for improved resistance, freeze-thaw stability, foam suppression, and pigment dispersion. Made in commercial volume, but not yet regularly manufactured. The Baker Castor Oil Co.

SYNTERGENT 25-M

This amber colored, 100% active liquid detergent exhibits excellent foam stability and detergent properties. It is especially effective in the presence of hard water. Its soil removing qualities are outstanding not only for textile fibers and fabrics but also for the removal of many household and industrial soils. Commercially available. Nopco Chemical Co.

TAMOL 731 (25% SOLUTION)

A sodium salt of a carboxylated polyelectrolyte. New type of dispersing agent for aqueous systems containing dyes, pigments, clays or other solids. Contains 25% active ingredients; pH of 10% solution is 9.5 to 10.5. Commercially available. Rohm & Haas Co.

TENLO-10

A modified polyethylene glycol fatty acid ester; light straw colored liquid; Sp. G. 1.0348 at 60°F.; soluble opalescent in water, soluble clear in isopropanol and toluol, dispersible in kerosene and 100 pale oil. Use: anti-static agent for removing and preventing static electricity on the surface of plastic articles such as film, records, upholstery, wall tile and display pieces. Commercially available. Griffin Chemical Co.

TENLO-68-5

A modified polyamine condensate; light amber, viscous liquid; Sp.G. 1.0041 at 60°F.; soluble milky in water, soluble clear in paraffinic and aromatic solvents and oils. Use: general purpose emulsifier for solvents and animal, vegetable and petroleum oils. For use in making Industrial soluble oils, cutting oils, wire drawing oils, leather treating compositions, polishes and greasing and degreasing compounds. Commercially available. Griffin Chemical Co.

TEOX 120—A NONIONIC SURFACTANT

O
R-CO-(CH₂-CH₂-O)₁₄-H. Surface active agents, commonly known as "Surfactants," are water soluble or dispersible agents containing hydrophilic (water-soluble) and hydrophobic (oil-soluble) groups. They are compatible with a wide range of cleaning materials and are comparatively insensitive to hard water. Light straw-colored liquid; odor, bland; Sp.G. at 25°C., 1.065-1.070; Weight/U.S. gallon, 8.9 lbs.; refractive index at 25°C., 1.4762; viscosity in centipoises at 25°C., 190; cloud point (2% aqueous solution), 50-60°C.; F.P., 9.5-10°C.; heat stable to 340°C; very slightly hygroscopic; pH (0.2% aqueous solution), 7.2. Uses: controlled sudsing nonionic detergent mixtures, cleaners, scouring and wetting agent for textiles, de-dusting, emulsifying agent and dispersant. Commercially available. Blockson Chemical Co.

TEOX COMPOUND 3

White, dust-free powder, pleasant lemon-like odor, pH: 10.5 in 1% aqueous solution, exceptionally high whiteness retention and soil removal in hard and soft water, typical screen analysis: 98% through 10 mesh, 70% through 40 mesh, density: 56 lbs. per cubic foot. Principal uses: home and commercial laundering, mechanical dishwashing, bottle and dairy equipment cleaning, metal cleaning. Commercially available. Blockson Chemical Co.

"TERGITOL"® NONIONIC NP-40

An alkyl aryl polyethylene glycol ether. Sp.G., 1.076 at 40°/20°C.; solidification temperature, 32°-33°C.; cloud point of 0.5% aqueous sol. >100°C.; sol. in water, complete, at 20°C.; odor, mild; white solid. "Tergitol" nonionic NP-40 is a nonionic agent that is soluble in water at the boiling point or in the presence of high concentrations of dissolved electrolytes.

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C W Report

Suggested uses: As a detergent and dispersant in high-temperature scouring and cleaning operations, where the effectiveness of other nonionics is limited by insolubility; as a leveling agent for dispersed dyes. Availability: Commercial quantities. Carbide and Carbon Chemical Co., a Division of Union Carbide and Carbon Co.

TETRACHLORODIFLUOROACETONE

$\text{CCl}_2\text{FOCOCCl}_2\text{F}$ M.W. 231.86; B.P. 123°C; water white liquid partly soluble in water but soluble in most organic solvents. Chemical Properties: Stable to acids but reacts with alkalies and organic bases to yield derivatives of dichloromonofluoroacetic acid. Availability: Experimental quantities. Allied Chemical and Dye Corp., General Chemical Div.

N-TETRADECANE (OLEFIN FREE GRADE)

$\text{C}_{14}\text{H}_{30}$, M.W. 198.38; M.P. 5.5°C.; B.P. 253.5°C.; Sp.G. 20°/4°C. 0.7632; R.I. 1.4289 at 20°C.; iodine value, m; hydroxyl value, nil; colorless liquid. High purity grade because of chemical treatment to remove unsaturates and oxygen-containing compounds. Suggested uses: special solvent and chemical synthesis; calibration and standardization; still chaser; filler for thermo-elements. Humphrey-Wilkinson, Inc.

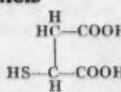
TETRAHYDROFURAN (THF)

$(\text{CH}_2)_4\text{O}$, M.W. 72.10; clear, colorless liquid with ether-like odor; miscible with most organic solvents and water; B.P. 65°C.; F.P. -108.5°C.; flash point (Tag closed cup) -17°C.; weight per gallon 7.4 pounds. Use: highly active solvent for high molecular weight polyvinyl chloride and polyvinylidene chloride copolymers; as a saturated cyclic ether THF reacts by substitution or ring cleavage. Available in commercial quantities. Electrochemicals Dept., E. I. duPont de Nemours & Co.

THERMOSCENT C.A.B.

A heat resistant odor mask for cellulose acetate butyrate melts. This is designed for direct incorporation and provides high odor coverage at low cost. Fritzsche Brothers, Inc.

THIOMALIC ACID



Assay (SH): 97% min.; ash: 0.5% max.; M.P.: 150°C min.; M.W. 150.15; off-white powder; solubility (approximate) in: water, 5 g/100 cc at 40°C.; ethanol, 50 g/100 cc at 25°C.; benzene, insoluble. Thiomalic acid is a polyfunctional compound which undergoes the typical reactions of both monoamines and di-carboxylic acids. We expect that it can be used in the pharmaceutical field, particularly with heavy metals. Sodium thiomalate is reported to be 20 times less toxic than BAL and more effective against poisoning by bismuth, mercury, arsenic, tin and gold. It also has diuretic properties. In other fields, it is claimed that thiomalic acid reduces the color of crepe rubber and is a tackifier for butadiene-type synthetic rubber. Its esters have been claimed as air-hardening coating compounds. Commercially available. Evans Chemicals, Inc.

THIOPHENOL

$\text{C}_6\text{H}_5\text{SH}$. Color, water white; assay, 99%. Physical Properties: B.P. 71°C at 15 mm. M.P. -1.5891; Sp.G. 25/25, 1.075; F.pt. .11 volt; pKa, 8.3; Thiophenol should be of interest to those working in the fields of pharmaceuticals, stabilization (polysulfone resins), plasticity (crude rubber), polymerization regulators, dye manufacturer, millability of butadiene interpolymers, and oil additives. Commercially available. Evans Chemicals, Inc.

THIOPHOSGENE

Thiocarbonyl chloride, CSCl_2 , M.W. 115.0; Sp.G. 1.509 at 15/4°C., B.P. 73.5°C. (72-75°C. quality supplied). Red liquid, soluble in organic solvents having no active hydrogen (reacts with active hydrogen compounds); insoluble in water.

Chemical properties: undergoes reactions like phongene, Friedel-Crafts to give thioacetones; with amines to give thiocarbamic compounds and substituted thioureas; with alcohols to give thiocarbonates and thiocarbonates. Hydrolyzes slowly; oxidizes slowly in air. Suggested uses: organic synthesis; dyes, insecticides, pharmaceuticals (thiobarbiturates, etc.), perfume ingredients; and rubber modifications. Pilot-plant quantities now available. Rapter Laboratories.

BAKER'S® THIXCIN

12-Hydroxystearin (modified). Waxy, white solid in the form of a finely-divided powder. Acid value, 2; iodine value, 4; sap, value, 180; passing No. 200 screen, 98%; passing No. 325 screen, 96%; bulk density, gm/cc, 0.25. Insoluble in water and all standard organic solvents. Suggested use: Thixin is a superior bodying and puffing agent. It imparts improved brushability, controls sag and aids in pigment suspension. Thixin inhibits bleeding and staining when used as an additive in calking compounds. Caution: Thixin loses this effectiveness at temperatures in excess of 80°C. The Baker Castor Oil Co.

THIXCIN 25

25% dispersion of Thixin in odorless solvent. Soft, crumbly gel. A non-yellowing multi-purpose paint additive. Thixin 25, is a 25% dispersion of Thixin in odorless solvent, usually added to the vehicle or paint portion. The Baker Castor Oil Co.

THYMIDINE

$\text{C}_{10}\text{H}_{14}\text{N}_2\text{O}_5$, M.W., 242; M.P., 185°C.; spec. rot. [a]_D, +32.5° (in 1.0 N NaOH); sol. in

water, methanol, hot alcohol, hot acetone, hot ethyl acetate, pyridine, glacial acetic acid, sparingly sol. in hot chloroform; color, white, crystalline (needles) powder. Chemical properties: Thymidine is one of the deoxyribonucleosides present in deoxyribonucleic acid. At pH 7 the ultraviolet absorption maximum is 267 m μ with a molar extinction coefficient of 9.2x10⁴. Characteristic absorption ratios are 0.85 (275/265), 0.67 (230/245) and 0.24 (290/280). Based on metaperiodate oxidation studies, it has been concluded that the lateral ring in the deoxyribonucleosides is of the furanoid type. Suggested uses: biochemical and medical research, pharmaceuticals. Availability: research and commercial quantities. Schwarz Laboratories, Inc.

TIGLIC ACID

$\text{C}_8\text{H}_6\text{O}_2$, M.W., 100.11 d¹⁰⁰ 0.9427; M.P., 64; B.P. 198.5. Sparingly soluble in cold water. Soluble in hot water. Spicy odor, color: white to light amber crystals. Chemical properties: can readily form esters for use in flavoring industry. Uses: flavors and organic syntheses. Availability: pilot production. Heifetz and Co.

TIN (OUS) FLUORIDE

SnF_2 , M.W., 156.70. White crystals. Soluble in water. Insoluble in excess HF. Acetone. Decomposed by heat. Grades: Pure. Availability: Laboratory scale. City Chemical Corp.

M-TOLIDINE DIHYDROCHLORIDE

$\text{H}_2\text{N}(\text{CH}_3)\text{C}_6\text{H}_3\text{C}_6\text{H}_3(\text{CH}_3)\text{NH}_2$, M.W., (as free amine) 212.28, M.P. (of free amine) 107-108°C. Sl. Sol. hot water. Chemical properties: undergoes reactions typical of benzidine; diazotization, acylation, alkylation. Properties are modified by the presence of the methyl groups. Suggested uses: in the syntheses of dyes, pharmaceuticals, and other organic chemicals. Availability: Commercial quantities. The Carwin Co.

TOLUIDINES

A mixture produced by coal hydrogenation; contains more than 97% toluidines with ortho, meta, and para isomers present in approx. 12:3:2 ratio; contains less than 2% tertiary nitrogen compounds and no nitro compounds as impurities. Avg. M.W. 108; Sp.G. 0.9935 at 20°/20°C.; Fr. P., -43°C.; distillation range, 197°-202°C.; color, brownish-red. Chemical properties: undergoes usual reactions of aromatic amines. Suggested uses: as special-purpose solvent; intermediate for dyestuffs (particularly those of the Magenta series where unique distribution of isomers offers possibilities for interesting variations of shades), textile finishing agents, rubber accelerators, flotation agents; as an octane improver for motor gasoline stocks either with or without tetraethyl lead. Availability: development quantities. Carbide and Carbon Chemicals Co., a division of Union Carbide and Carbon Corp.

PENCO TOXAPHENE DDT E-2:1

An emulsifiable concentrate containing 40% toxaphene (technical chlorinated camphene, chlorine content 67-69%), and 20% DDT in combination as active insecticidal ingredients. The product ready forms milky white stable emulsions upon mixing with water. It is used as a spray for the control of most cotton insect pests at rates of from 1 to 4 pints of product in 3 to 10 gallons of water per acre. Commercially available. Pennsylvania Salt Mfg. Co. of Washington.

Toxaphene (technical chlorinated camphene, chlorine content 67-69%), and 20% DDT in combination as active insecticidal ingredients. The product ready forms milky white stable emulsions upon mixing with water. It is used as a spray for the control of most cotton insect pests at rates of from 1 to 4 pints of product in 3 to 10 gallons of water per acre. Commercially available. Pennsylvania Salt Mfg. Co. of Washington.

TREM-014

A polyglycol ester; honey-colored liquid; Sp.G., 1.020 at 60°F.; soluble in aromatic and chlorinated hydrocarbons, ester and oil type plasticizers. Use: to reduce viscosity of polyvinyl chloride plastics. Commercially available. Griffin Chemical Co.

TRIALYL CYANURATE

$(\text{CH}_2=\text{CHCH}_2\text{O})_3\text{C}_6\text{N}_3$, M.W., 249.26; Sp.G., 1.1133 at 30°C.; R.I., 1.5049 at 25°C.; M.P., 27.32; B.P., 120°C. (5 mm.); miscible with ethanol and benzene. Readily undergoes addition polymerization and can be transesterified. Cross-links polyester resins to give exceptional heat stability. Available in semi-commercial amounts. American Cyanamid Co.

TRIALLYL AMINE

$(\text{C}_5\text{H}_11)_3\text{N}$, M.W., 227.42; Sp.G., 0.78-79 at 20°/20°C.; color, pale yellow; amino content, 99%; B.P., 235°C.; F.B.P., 260°C.; flash point (open cup), 190°F. Suggested uses: as an intermediate for oil-soluble organic chemicals, and corrosion inhibitors. Available in semi-commercial quantities from Sharples Chemicals Inc.

O.O.O-TRIBUTYL PHOSPHOROTHIOATE

$(\text{C}_4\text{H}_9)_3\text{PS}$, M.W., 282.3; Sp.G., 0.987 at 20°/4°C.; R.I., 1.4491 at 25°C.; B.P., 142.5°C. (4.5 mm.); viscosity 77°F 3.23 cs., at 100°F 2.41 cs., at 210°F 1.06 cs.; flash point (open) 295°F.; fire point (open) 355°F.; odor, mild, characteristic; colorless liquid; toxicity, LD₅₀ single dose oral (rats), 10,000 mg/kg; insol. in water, miscible with acetone, alcohol, benzene, carbon tetrachloride, ether, heptane, kerosene and mineral oil; chemical properties: characterized as a neutral ester and reacts only under forcing conditions. At elevated temperatures thio sulfur gradually exchanges with alkoxyl oxygen. With strong oxidizing or reducing agents, sulfur can be removed. Suggested uses: as an additive for lubricants and gasoline, as a specialty solvent and plasticizer, as an antifoam agent, in textiles as a flame retardant or softener, and as an intermediate for chemical syntheses. Availability: Development quantities. Virginia-Carolina Chemical Corp.

TRICHLOROTRIFLUOROACETONE

$\text{CCl}_2\text{F-CO-CCl}_2\text{F}$ M.W. 215.40; B.P. 83.2°C; water white, remains a liquid at -110°C; vapor pressure equation, log $P_{\text{psia}} = 5.7675 - 1639.6/T^{\circ\text{K}}$; soluble in all proportions with water and soluble in most organic solvents. Chemical Properties: Stable to acids but reacts with alkalies to form derivatives of monochlorodifluoroacetic acid. Availability: Experimental quantities. Allied Chemical and Dye Corp., General Chemical Div.

TRIDECYL ALCOHOL

$\text{C}_{13}\text{H}_{27}\text{OH}$; M.W. 200; Sp. G., 20/20°C. -0.8434; boiling range 232-272°C. (estimated from distillation at 10 mm pressure converted to 760 mm); water-white color; viscosity 47.5 c.s. at 20°C.; purity -99%. Mixtures of primary isomeric alcohols (principally tetradecyl isomeric alcohols). Suggested uses: manufacture of ester-type plasticizers; nonionic detergents, anionic detergents, defoliants, textile lubricants, mercaptan rubber modifiers, synthetic lubricating oils and hydraulic fluids. Available in tank car quantities. The Enjay Co.

TRIETHANOLAMINE HYDROCHLORIDE

$\text{C}_6\text{H}_{15}\text{NO} \cdot \text{HCl}$ M.W. 185.65. Chloride content, 19.1%. White, practically odorless crystals. M.P. app. 177°C. Soluble in water and alcohol. Chemical properties: In solution, the Trihydroxytriethylamine radical becomes available. Suggested uses: In organic syntheses where it is desirable to use a pure crystalline, rather than an impure liquid starting material. Availability: Experimental quantities. Chemo Puro Mfg. Corp.

TRIETHYLAMINE-SULFUR TRIOXIDE

$(\text{C}_2\text{H}_5)_3\text{NSO}_3$, M.W. 181.25; M.P. 91.5°C; White crystalline solid, free flowing, stable, non-hygroscopic. Slightly soluble in cold water, soluble in hot water (with slow hydrolysis), soluble in alcohols (with reaction), soluble in dimethyl-

formamide, very slightly soluble in hydrocarbons. Chemical Properties: A sulfating agent. Suggested Uses: Sulfating agent for alcohols and phenols. Can be used in aqueous solution to prepare leuco sulfates of vat dyes. Availability: Experimental quantities. Allied Chemical and Dye Corp., General Chemical Div.

TRIETHYL ORTHOPROPIONATE

$\text{CH}_3\text{C}(\text{OC}_2\text{H}_5)_3$ • M.W. 162.22; B.P. 144-148°C.; Sp.G. 0.8933 @ 20°/20°C.; odor, pungent; color, water white. Chemical properties: This compound may be used as a source of the ethoxy ethyldine group. Suggested uses: In the synthesis of dyes, pharmaceuticals and other organic chemicals. Availability: Semi-commercial. Kay Fries Chemicals, Inc.

TRIETHYL ORTHOPROPIONATE

$\text{CH}_3\text{CH}_2\text{C}(\text{OC}_2\text{H}_5)_3$ • M.W. 176; B.P. 155-160°C. @ 760 mm.; appearance, colorless liquid. Source for the ethoxy propylidene group. Suggested uses: In the synthesis of dyes, pharmaceuticals, and other organic chemicals. Availability: Semi-commercial. Kay Fries Chemicals, Inc.

TRISOBUTENYL SUCCINIC ANHYDRIDE

$\text{C}_6\text{H}_{12}\text{O}_3$. M.W. 266.37; Fr. P. 54°C.; distillation range, 172-179°C. (5 mm.); color, light yellow. Chemical properties: Hydrolyzes at high temperatures to form a dibasic acid, reacts with alkalies, amines, and alcohols. Suggested uses: As an anti-rust additive for fuels and lubricants and as an intermediate for corrosion inhibitors, grease thickeners and plasticizers. Availability: commercial quantities. Carbide and Carbon Chemicals Co., a Division of Union Carbide and Carbon Corp.

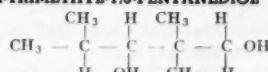
O,O,O-TRISOCTOXYL PHOSPHOROTHIOATE

$(\text{C}_8\text{H}_{17}\text{O})_3\text{PS}$. M.W. 450.7; Sp.G. 0.933 at 20°/4°C.; R.I. 1.4580 at 25°C.; B.P. 160-70°C. (0.2mm); viscosity 77°F. 13.00 cs. at 100°F 9.16 cs. at 210°F 2.70 cs.; flash point (open) 410°F; fire point (open) 470°F; odor, mild, characteristic; colorless liquid; toxicity, LD₅₀ single dose oral (rats), greater than 21,000 mg/kg; insol. in water, miscible with acetone, alcohol, benzene, carbon tetrachloride, ether, heptane, kerosene and mineral oil; chemical properties: characterized as a neutral ester and reacts only under forcing conditions. At elevated temperatures thiono sulfur gradually exchanges with alkoxy oxygen. With strong oxidizing or reducing agents, sulfur can be removed. Suggested uses: as an additive for lubricants and gasoline, as a specialty solvent and plasticizer, in textiles as a softener, and as an intermediate for chemical syntheses. Availability: development quantities. Virginia-Carolina Chemical Corp.

TRIMETHYLAMINE-SULFUR TRIOXIDE COMPLEX

$(\text{CH}_3)_3\text{N} \cdot \text{SO}_3^-$. M.W. 139.17; M.P. 240°C; White crystalline solid, free flowing, stable, nucavoscopic. Slightly soluble in cold water, soluble in hot water (with slight hydrolysis), soluble in alcohols (with reaction), soluble in dimethylformamide, very slightly soluble in hydrocarbons. Chemical Properties: A sulfating agent. Suggested Uses: Sulfating agent for alcohols and phenols. Can be used in aqueous solution to prepare leuco sulfates of vat dyes. Availability: Experimental quantities. Allied Chemical and Dye Corp., General Chemical Div.

2,2,4-TRIMETHYL-1,3-PENTANEDIOL



Form, Solid; Color, White; Boiling Range, 109°-111°C/4 mm.; M.P. 49°-51°C. Purity 95% minimum. The diesters of dicarboxylic acids formed upon their reaction with 2,2,4-Trimethyl-1,3-pentanediol are suitable candidates for hydraulic fluids and various lubricant additives. Lubricants adaptable for low temperature use are produced by the esterification of this diol with branched chain acids such as 2-ethylhexanoic acid. The glycol can be reacted with maleic anhydride and phthalic anhydride to produce alkyl resins. 2,2,4-Trimethyl-1,3-pentanediol has also been suggested as a possible ingredient in insect repellent formulations for use against mosquitos and chiggers, Eastman Chemical Products, Inc.

TRITON AS-35

An anionic sulfated fatty alcohol characterized by high foam, excellent detergency, good wetting and level dyeing properties. 30% active ingredient, readily soluble in water. pH of 5% solution is 7.0-8.5. Commercially available. Rohm & Haas Co.

TRITON GR-5

An anionic sulfonated alkyl ester. Highly efficient wetting-rewetting agent for various

phases of wet processing in the textile industry. Has 60% active ingredients, with a pH of a 1% solution being 7.3. Commercially available Rohm & Haas Co.

TRITON X-67

A non-ionic polyoxyethylene ether of fatty alcohol. A degreasing, emulsifying and leveling dyeing agent. A wax-like solid containing 100% solids, with a pH of 1% solution being 7.5-8.5. Commercially available. Rohm & Haas Co.

TRITON X-170

A new versatile soft water emulsifier (blend of alkyl aryl polyether alcohols with organic sulfonates) for use in agricultural pesticide formulations. Particularly efficient for emulsification of toxaphene-kerosene and DDT, aldrin, etc., systems in natural soft waters. Triton X-170 can be blended into Triton X-170 to provide convenient emulsifier combinations for use with many toxicant-solvent systems over a wide range of water hardness conditions. Physical properties: color—brown; Sp. G. at 25°C. 1.04-1.06; viscosity (Saybolt 100°F.), 1600 seconds (average). Available in commercial quantities. Samples and literature on request. Rohm & Haas Co.

D-TRYPTOPHAN O.S.

$\text{C}_11\text{H}_{14}\text{O}_2\text{N}_2$. M.W. 204.2; spc. rot. $[\alpha]_{D}^{25} + 30.5$ to $+ 31.5^\circ$ ($c = 0.5$ in H_2O); optically standardized. Suggested uses: biochemical and nutritional research. Schwarz Laboratories, Inc.

URACIL-4-ACETIC ACID

$\text{C}_6\text{H}_4\text{N}_2\text{O}_4 \cdot \text{H}_2\text{O}$. M.W. 188. A pyrimidine substituted acetic acid, soluble in basic solutions. Suggested uses: as a higher homolog of Orotic Acid may be of interest in biochemical and bacteriological studies. Availability: Research quantities. Krishell Laboratories, Inc.

URACIL-5-CARBOXYLIC ACID

$\text{C}_5\text{H}_4\text{N}_2\text{O}_4 \cdot \text{H}_2\text{O}$. M.W. 174. A new carboxylic acid derivative of uracil readily soluble in hot water and basic solutions. Suggested uses: as an isomer of orotic acid may be of interest in biochemical and bacteriological studies. Availability: Research quantities. Krishell Laboratories, Inc.

UV ABSORBER 9

A benzophenone derivative which is a pale cream powder and melts at 63-64.5°C.; M.W. 228; Sp.G. 1.324; odorless. Insoluble in water and soluble in a number of common organic solvents and resin plasticizers; compatible with vinyl, acrylic, styrene and cellulose plastics. Strongly absorbs ultraviolet light but is transparent to visible light. Applications: Prevents yellowing and other deterioration of vinyl chloride, methyl methacrylate, and styrene polymers; may be of use in dyes and pigments, wax, soap, paper and textiles. Available in commercial quantities. American Cyanamid Co.

VANADIUM (VANADYL) ACETATE (BASIC)

Green powder of variable composition. Slightly soluble in water and acetic acid. Grade: pure. Availability: Laboratory scale. City Chemical Corp.

VANADIUM (VANADYL) OXALATE

$\text{VO C}_2\text{O}_4$. M.W. 154.97. Blue powder or crystalline masses. Very soluble in water. Grades: Technical, C.P. Availability: Laboratory scale. City Chemical Corp.

VANADIUM (TETRA) OXIDE

V_2O_4 . M.W. 165.90. Dark blue-black crystalline masses. Insoluble in water. Soluble in dil. mineral acids. Grades: Technical, C.P. Availability: Laboratory scale. City Chemical Corp.

VANADIUM (IC) SULFATE

$\text{HV} (\text{SO}_4)_2 \cdot 5\text{H}_2\text{O}$. M.W. 316.0. Light green powder. Soluble in water, insoluble in cone. H_2SO_4 oxidized by prolonged exposure to air forming vanadyl sulfate. Grade: pure. Availability: Laboratory scale. City Chemical Corp.

V-BOR*

Refined pentahydrate borax, 99.5% $\text{Na}_2\text{B}_4\text{O}_7 \cdot 5\text{H}_2\text{O}$. A concentrated and refined grade of sodium tetraborate, having the advantage of weight saving in long distance shipments. American Potash and Chemical Corp.

VELVASIL SILICONE FLUIDS

A carefully selected series of silicone fluids recommended for cosmetic, pharmaceutical and toilet goods applications. Velvasil fluids are characterized by their physiological inertness, excellent

water repellency and low surface tension. They are odorless, tasteless, colorless and can be readily emulsified. Suggested uses: protective skin creams, baby lotions, sun-tan lotions, medicinal bases, hair dressings, etc. Commercially available, they can be supplied in viscosities ranging from 40 to 100,000 centistokes. General Electric Co.

VINAC ASB-10 BEADS

A solid form of a vinyl acetate copolymer, which is insoluble in water, but soluble in alkaline solutions or organic solvents. Colorless; Bulk Density, 50 lbs. (approx.) per cubic foot; Viscosity, 9-11 cps. Films show excellent water and grease resistance, plus gloss. Uses: Base for adhesives, textile size for "Dacron," "Orlon," and "Acrilon;" base for self-polishing floor waxes. Commercially available. Colton Chemical Co., A Division of Air Reduction Co., Inc.

VINAC CE#1-P. POLYVINYL ACETATE EMULSION

A polyvinyl acetate emulsion for use with Portland Cement mortars. Solids content, 55%; pH, 4.5-5; pounds per gallon, 9.0; particle size, 4.5-5 microns. Uses: When combined with Portland Cement and sand mixes this resin will increase tensile strengths 3-10 times and extensions at rupture are more than 10 times those of ordinary cement mortars with the same water ration. The resin can also be used as a bonding agent between concrete and wood, old concrete, metal or many other materials. Commercially available. Colton Chemical Co., A Division of Air Reduction Co., Inc.

VINAC HF. HIGH VISCOSITY POLYVINYL EMULSION

A polyvinyl acetate emulsion having a viscosity of 3700-4200 cps @ 20°C.; pH 4.4-5; solids, 55% minimum; free monomer, 0.5% maximum; particle size, 1 micron (approx.); Sp.G. 1.11; weight per gallon, 9.29 pounds; appearance, creamy white emulsion. Suggested Uses: Basic material in adhesives, textile and paper finishes and coatings; saturants, binders, primers, sealers, interior and exterior paints. Commercially available. Colton Chemical Co., A Division of Air Reduction Co., Inc.

VINAC P-100. INTERNALLY PLASTICIZED POLYVINYL ACETATE EMULSION

A polyvinyl acetate emulsion which is internally plasticized. Solids content, 57-58%; viscosity @ 68°F., 600-900 cps.; pH, 5-6; free monomer, 0.5% max.; particle size, 0.5 to 1 micron; weight per gallon, 9.2 pounds; appearance, creamy white emulsion; films are clear, tough and flexible. Uses: A vehicle for primer, sealer, interior and exterior paints. Commercially available. Colton Chemical Co., A Division of Air Reduction Co., Inc.

VINOL PA SERIES

A series of partially acetylated polyvinyl alcohol resins with viscosities of 5, 22, and 40 cps. Hydrolysis, 86-89%; Insolubles (in water) 1.0% max.; Volatiles, 3.0% max.; Ash, 1.5% max.; pH, 5-7; Gel characteristics, non-gel; color, white; Emulsifying characteristics, excellent. Uses: Adhesives, sizes, binders, coatings, films and emulsifying agents. Colton Chemical Co., A Division of Air Reduction Co., Inc.

N-VINYL-2-PYRROLIDONE

$\text{CH}_2\text{CH}_2\text{CH}_2\text{CONCH}=\text{CH}_2$. M.W. 111.14, Sp.G. 25°C. 1.04, F.P. 13.5°C. B.P. 193°C at 400 M.M., R.I. 1.51. Clear colorless liquid with a mild odor. Very soluble in water, ethanol and ethyl ether. Chemical properties: Copolymerizes readily with almost all vinyl monomers such as vinyl chloride, vinyl acetate, acrylonitrile, styrene, maleic anhydride. Suggested uses: Additive to homopolymers to permit variation and control of special characteristics such as improved hydrophilic character. Availability: Semi-commercial quantities. General Aniline & Film Corp.

VISCASIL SILICONE FLUIDS

Viscasil Fluids are 100 per cent methyl silicone fluids supplied in several viscosities ranging from 1,000 to 100,000 centistokes at 25°C. They are finding utility in a wide variety of applications as release agents, damping media, protective dressings, water repellents, cosmetic and pharmaceutical ingredients. Viscasil Fluids are characterized by relatively small change in viscosity over a wide temperature range, good oxidative stability, unusual chemical inertness and resistance to breakdown under mechanical shearing. Commercially available. General Electric Co.

XNO RESIN G-36

An aqueous solution of a partially condensed modified urea formaldehyde resin. Properly applied and cured, it imparts highly durable stiff or crisp resilient effects on nylon constructions. It affords good resistance to flammability on nylon. Commercially available. Onyx Oil and Chemical Co.

for Coconut Oil
Fatty Acids
and Methyl Esters

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EL DORADO

PURITY
for SERVICE
UNIFORMITY

El Dorado has specialized in coconut oil products for more than half a century. That's one big reason you can depend on the performance of El Dorado products in your formulations. You'll find that El Dorado's standards are the highest in the industry.

FATTY ACIDS

CAPRYLIC	ELDHYCO*	CAPRIC
LAURIC	COCONUT	MYRISTIC
		PALMITIC

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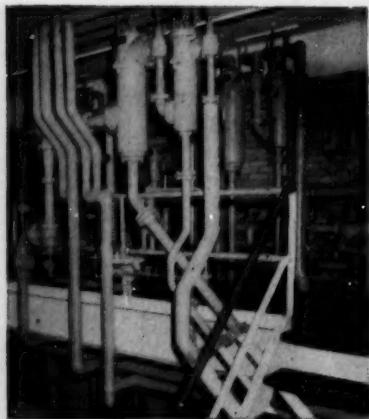
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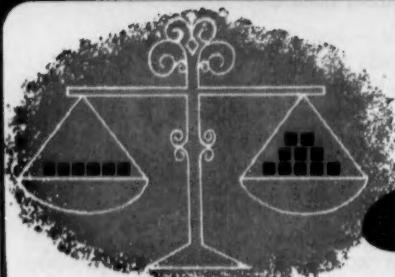


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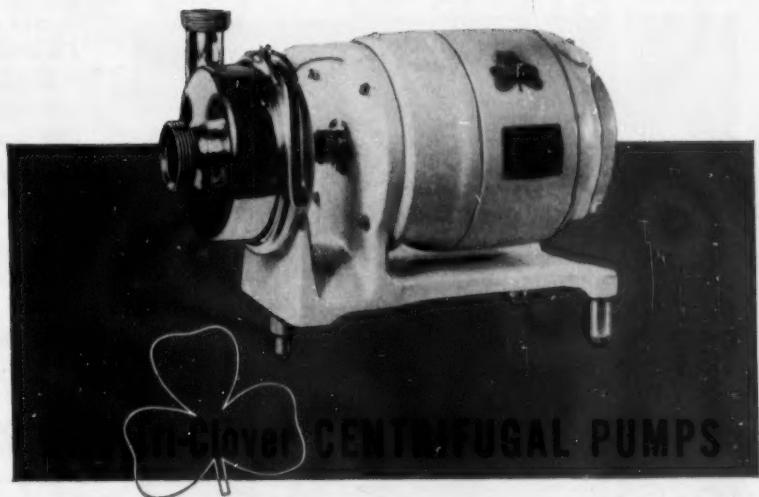
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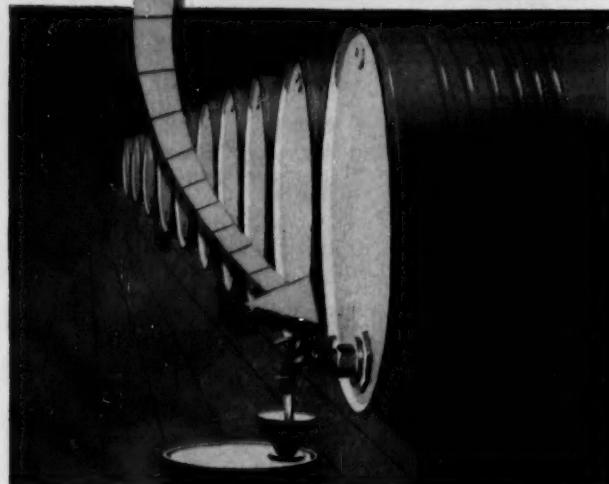
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PROPARGYL HALIDES $\text{HC}\equiv\text{CCH}_2\text{X}$	Three centers of reactivity. Chemical intermediate for terpenes and pharmaceuticals, etc. Agricultural uses as soil fumigant, etc.	N-METHYL-2- PYRROLIDONE $\begin{array}{c} \text{H}_2\text{C}-\text{CH}_2 \\ \\ \text{H}_2\text{C}-\text{C}=\text{O} \\ \\ \text{N} \\ \\ \text{CH}_3 \end{array}$	Powerful organic solvent for acrylonitrile polymers and copolymers, cellulose triacetate, etc. Selective solvent for acetylene in natural gas. Spinning agent for polyvinyl chloride solution.
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From Research to Reality

SPECIALTIES



JESTER AND DUNEGAN: On the farm, antibiotics try for new chores.

Two to Talk About

Sandwiched, timewise, between hurricanes Carol and Edna, the National Agricultural Chemicals Assn. held its 21st annual meeting on the storm-swept Jersey Shore at Spring Lake. This year, with a so-so season of sales volume and profits, much of NACA's interest centers around a pair of comparative newcomers—the recently enacted Miller Pesticide Amendment, and the applications of antibiotics to agriculture.

The Miller Act, Public Law 518,* is, in a large sense, nothing new. The NACA has been plugging for most of its features for two years. But its actual passage has startled many pesticide makers into the realization that now they really aren't sure what they'll have to do under the law they hoped for so long.

A panel discussion on the Miller Act drew, therefore, considerable attention. William Goodrich, assistant general counsel for the Food & Drug

Administration, and John Coyne, assistant head of the plant regulation section of the Dept. of Agriculture, explained in considerable detail the functions their departments will have in carrying out the new law. John Conner and Joe Noone, of NACA, helped to clarify points on procedures, costs, and time involved in getting certification.

Questions put to the panelists uncovered some of the facets of the act that already puzzle pesticide makers. Samples: Just what residues will be classified as zero residues? (So far, zero means zero, and nothing else.) When should a firm start seeking certification of tolerances? (Exact procedures haven't been settled on by FDA and USDA, but firms are advised to have their data assembled.) If residues are established for one firm's pesticide, are they then set for that same pesticide made by another firm? (Yes.)

Pharmacy to Farm: That antibiotics may turn out to be a shot in the flank for agriculture was made apparent by the talks of William Jester (FDA) and John Dunegan (USDA). Again, antibiotics aren't completely unfamiliar to agriculturalists. They've already gained a firm position in food production, principally as feed-fortifying agents.

As Jester pointed out, and Dunegan

* Briefly, the Miller Act deals with the amounts of pesticide (insecticides, fungicides, weed killers, rodenticides, but not defoliants) residue that may be left on "raw agricultural commodities." It is up to USDA to determine—and certify—that a particular pesticide is useful for a proposed purpose, and to tell what residue will likely remain when it is applied. The job of FDA is to determine, on information available to it, if such residues are safe.

The complete law, as well as helpful interpretation of it, is available from NACA, 910 17th St. N.W., Washington, D.C. Transcripts of panel members' remarks, along with some questions and answers, will be sent to members.

amplified, it probably won't be in food preservation that antibiotics will get their next big job in agriculture. Instead, it looks much more likely that—costs permitting—they will aid in control of fungus and bacterial diseases of plants (CW, June 5, p. 56; Sept. 4, p. 66).

The plant blights that succumb to antibiotics are numerous—mint rust, cherry leaf spot, apple scab, pear and apple blight, halo blight, black leg (on potatoes), tobacco blue mould, to name a few. Dosages of antibiotics are so small the farmers will have to re-establish their ideas of agricultural sprays. A far cry from the usual pounds per gallon, dosages of perhaps 38 grams per 100 gallons will be typical (giving solutions of 100 parts per million).

Although there is still much experimentation to do, Dunegan put the



DOW'S ALLEN: Plenty of work ahead for NACA's new president.

value of antibiotics like this: ". . . the antibiotic materials offer possibilities of disease control we hardly dared dream of 10 years ago."

Antiscare Campaign: As outgoing President Paul Mayfield (Hercules Powder Co.) pointed out, one of the big jobs of NACA is to improve the public attitude toward insecticidal chemicals. Some compounds have been much maligned in recent months, fingered as the cause of a variety of diseases.

Dr. David Price, assistant surgeon general of the U.S. Public Health Service, put facts like this on the line: citing a comprehensive study by PHS



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For a quick review of the ways in which you can use CACHALOT fatty alcohols write for the booklet "Possibilities". M. Michel and Company, Inc., 90 Broad Street, New York 4, N. Y. Basic suppliers to chemical manufacturers for over twenty-five years, their trade name for fine fatty alcohols is

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in the Mississippi delta—clinical studies, school attendance, areawide mortality records, etc.—he said there was no evidence that pesticides were related to the occurrence of disease.

Still more on the positive side for chemicals, Price pointed to the vast improvements in health (e.g., lessening the incidence of malaria in a number of countries) that can be credited to insecticides.

Price underlined that new insecticidal materials are needed, and emphasized that full data on their health aspects are also necessary.

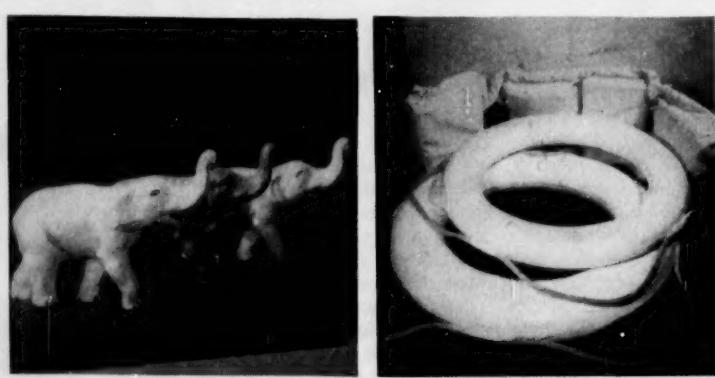
Lots to Do: But the farmer is not as much concerned with health aspects of agricultural chemicals as he is with seeking better weapons to aid in his war on pests. Dr. Byron Shaw, Agricultural Research Service, USDA, listed some areas of the farmer's need:

- More soil-pest destroyers.
- New materials and techniques of combating range and grassland pests.
- Specific herbicides for specific weeds.
- Plant growth regulators for cotton to prevent regrowth after defoliation.
- More combined pest control materials—one-shot treatments to kill weeds and insects.

To lead the ag chemical makers in their chores in the coming year, NACA picked new officers: William Allen (Dow Chemical Co.) took over as president of NACA. Lea Hitchner was re-elected as secretary-treasurer. New board of director members are Chester Brown (General Chemicals Div., Allied Chemical and Dye Corp.); Charles Sommer, Jr. (Monsanto); Jack Vernon (Niagara Chemical Div., Food Machinery & Chemical Corp.).

They'll all have plenty of work to do in the year ahead. But they have the legislation they've sought, and a constantly growing roster of agricultural chemicals to work with. It's hard not to be optimistic about such a progressive industry.

Detergent Aerosol Therapy: Detergent aerosol vapor used with other therapeutic measures can reduce mortality in children with bronchiolitis. That's the report from a hospital in Greenwich, England. Among the detergents employed were sodium lauryl sulfate, polyoxyethylene sorbitan mono-oleate, and a 0.125% aqueous solution of an oxyethylated tertiary octylphenol-formaldehyde polymer combined with a 2% solution of sodium bicarbonate and a 5% solution of glycerin.



Expandable from Overseas

GRABBING a lot of attention lately in Europe is an expandable form of polystyrene called Styropor. It's made by Badische Anilin- & Soda-Fabrik, AG (Ludwigshafen am Rhein, Germany). In some ways, it resembles the similarly expandable polystyrene marketed by Koppers (CW, March 13, p. 98). But a recent patent issued to BASF (U.S. Pat. 2,681,321) covers an expandable product whose foaming agent

is dissolved in the styrene monomer—that appears to be the basic difference between Styropor and the Koppers product.

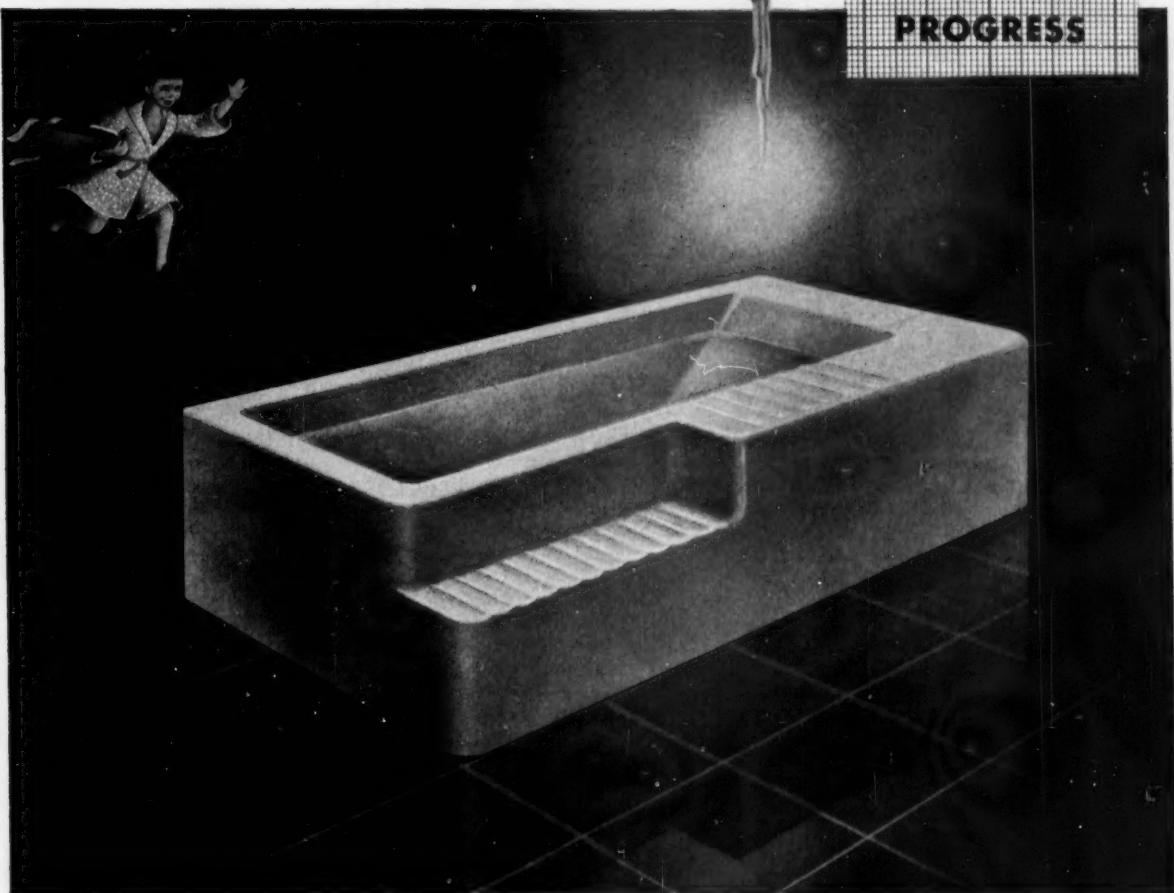
Sold as beads or 10-cm. discs, it can be swelled 30 times its first volume by heating to about 95°C. Steam or lower temperatures can be used, too. Expansion results as tiny, enclosed cells form. In molds, the Styropor can be made into floats and toys (above).

Q.

Could chemical research develop reinforceable liquid resins to produce strong, light plastics that could be "worked" easily and inexpensively—especially in large sizes?

A.

**THE "SYRUP" THAT
PUTS NEW PLASTIC SHAPES
AT YOUR FINGER TIPS**



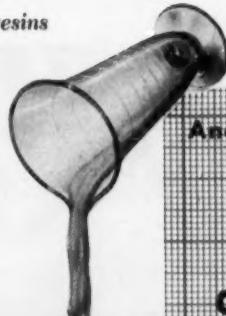
Here you see one unusual example of what the "syrup," known as polyester resins, makes possible in design and production.

By combining G-E polyester resins with glass fiber or other reinforcing material, you can mold, simply and easily, large or small plastic shapes of your choosing.

For example, you can produce lightweight bathtubs* that would be warm to the touch, colorful and pleasing to the eye, and resilient to falling objects . . . or, auto bodies and other housings that cannot dent like metal, that resist heat, cold and corrosion.

At low fabricating costs, you can build bathtubs or auto bodies, luggage or aircraft parts—just about anything

*G. E. does not manufacture such products, but merely supplies the polyester resins.



Another example of



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For new developments in Plastics Compounds, Silicones, Electrical Insulating Materials, Industrial Resins and Varnishes, Plastics Laminating and Molding . . . write for new "G-E Chemical Products" booklet (CDG-101) to: **CHEMICAL AND METALLURGICAL DIVISION**, General Electric Company, Sect. 1400-3B, Pittsfield, Massachusetts.

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SPECIALTIES



RUBBER MAGIC LEADERS*: Stretchable, waterproof—rubber's made them a new specialty.

Retread for Old Standby

Not since Charles Goodyear was fuming the kitchen up with India rubber and sulfur has natural rubber found friends like it has at Rubber Magic, Inc. Reason: Natural rubber is the base of the Brooklyn firm's widely applicable specialty, Rub-R-ize. (CW, May 8, p. 60).

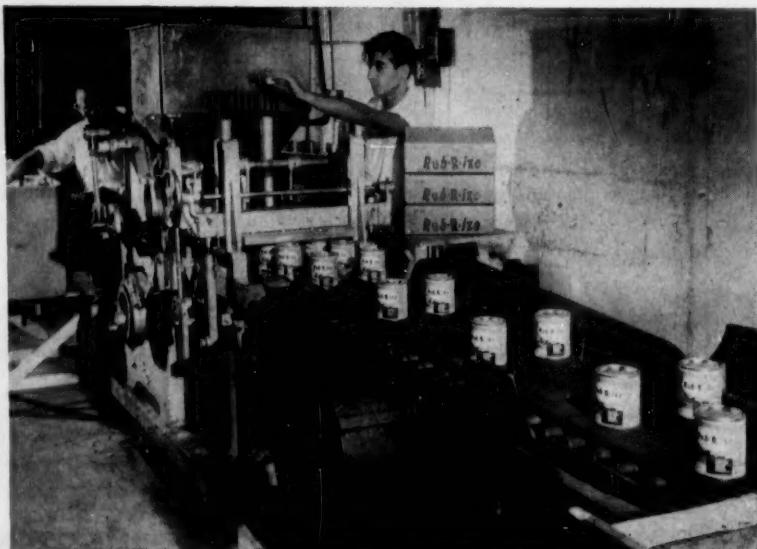
Essentially, Rub-R-ize is a "liquid rubber." Applied to almost any surface, it dries in 24 hours, leaves a flexible, nonsticky coating of pure rubber. Nearly everything, from repairing convertible tops to slipproofing rugs, is among the legion of suggested uses.

But it was as a waterproofing compound that Rub-R-ize was originally conceived by Alfred and Fred Oddo. They found that natural rubber, rather than any of the synthetics or plastics they tried, could be best modified to suit their needs. They started making their specialty about 15 months ago; then Hal Weiss (*see cut*) joined them last May to add a promotional kick to the selling.

The Oddos claim no scientific wonders in the manufacture of Rub-R-ize. And they make no bones about it being simple to turn out—it is basically just mixing rubber with the proper agents to keep it in flowing form. In their Brooklyn plant, contents of the main mixing vat flow by gravity to the filling machine (*see cut*), which can fill 2,400 units/hour.

Plenty to Sell: Simplicity of use,

variety of application. Those are the major points stressed in the promotion of Rub-R-ize. It can be brushed, dipped, or poured on. It adheres to fabrics and other porous material, but peels easily from metal or glass. (A primer has been developed to make it adhere to metals, but Rubber Magic hasn't gone into production of it yet.) The dried compound is simply rubber, with all the advantages—and limitations—of the natural product, the firm says.



CANNER: Automatically packed, Rub-R-ize is readied for distributors.

* L. to r: Alfred Oddo, Fred Oddo, Harold Weiss.

The liquid can be readily thinned-by water. Five colors, plus transparent, are standard. The liquid product is nonflammable.

In consumer magazines (those directed to do-it-yourself handymen), and in department stores, the product is suggested for electrically insulating tools (e.g., wire cutters), lining garbage pails, patching hose, repairing and waterproofing fabrics, and for such unusual feats as rustproofing automobile exhaust pipes.

It is sold nationally, through department and variety stores, and by direct mail. Introduced in $\frac{1}{2}$ -pint cans (\$1.29), it is now also put up in pints (\$1.98) and quarts (\$3.75). Lately, Weiss says, the sales of the larger containers has jumped ahead of the small units, and he's pushing for bulk sales.

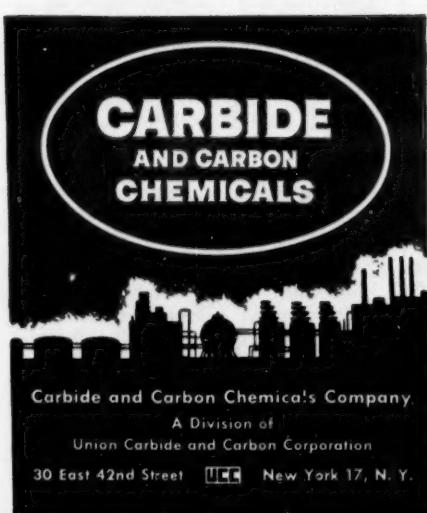
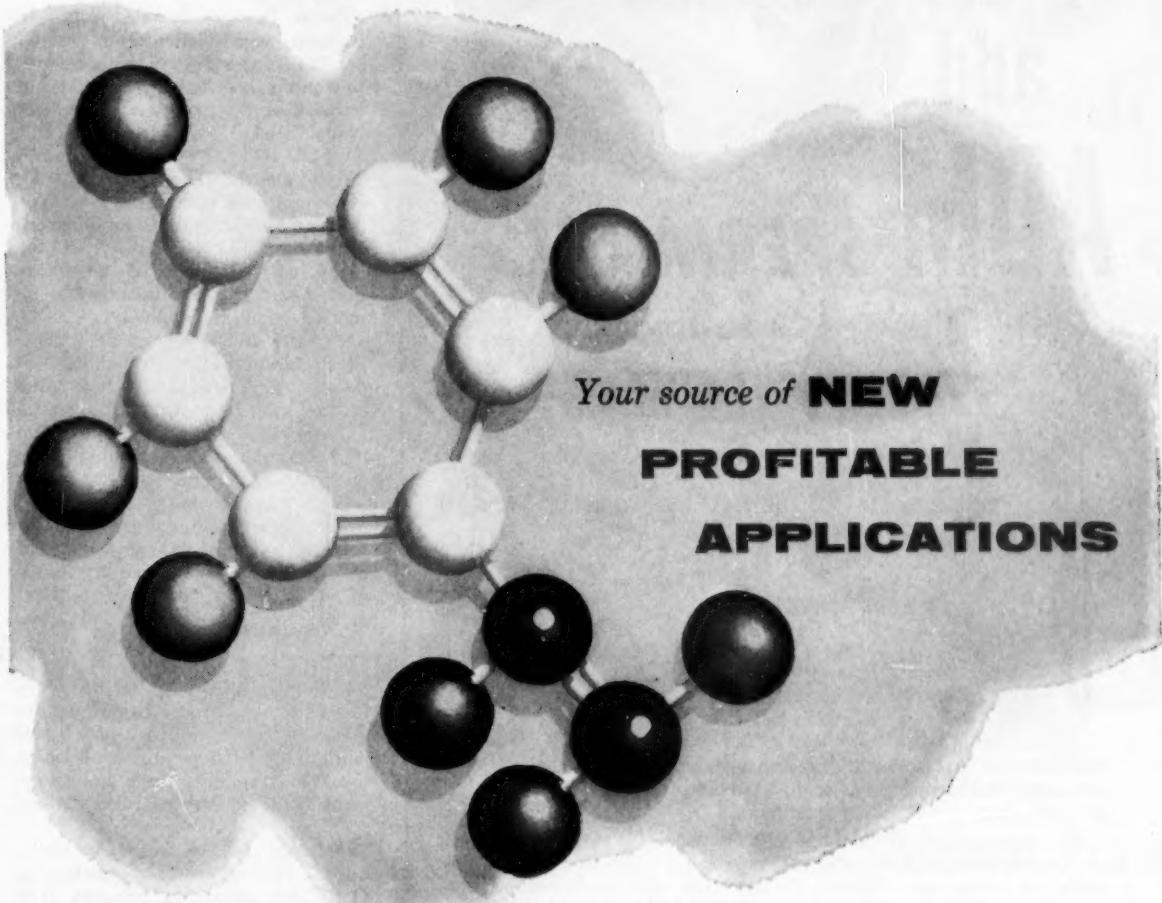
Without discounting the value of specialties based on plastics and synthetics, Rubber Magic, Inc. plans to stand by natural rubber as a raw material. "There's a lot of merit—and profit, too—in that old standby," says Weiss. "We think Rub-R-ize won't take second place to any product."

Bulletins: Here are some of the latest:

- Agricultural Chemicals (Eston Chemicals) Div. of American Potash & Chemical Corp. has published an information folder on the application of Aratron to destroy infestations of spider mites on crops.
- Emjay Maintenance Engineers (Rutherford, N.J.) has issued a guide on the use of asphaltic mastic protective coatings for industrial plants and equipment.
- Hercules Powder Co. offers a

Styrene

from CARBIDE AND CARBON



Carbide and Carbon Chemicals Company.

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Copolymerization of styrene and the unsaturated alkyds of glycols and maleic acid produce low-pressure laminating resins for shape-molded objects.

Surface-coatings incorporating styrenated drying oils are popular because of their resistance to acids and alkalies; high gloss; resistance to yellowing; and quick drying properties.

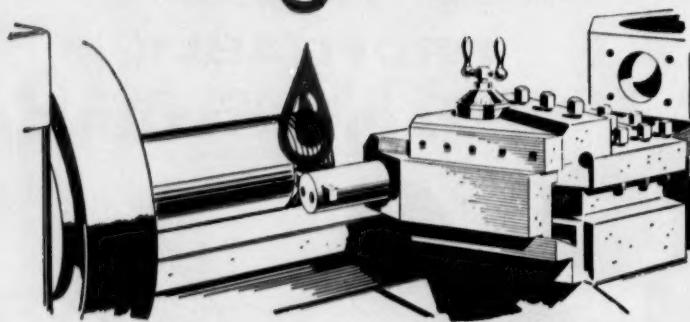
Styrene-butadiene copolymers are another example of how this monomer can benefit you. These compounds have wide applications—GR-S rubber; shoe soles and heels; luggage; floor tile; emulsion type paints; and electrical insulation.

A call to your CARBIDE Technical Representative will bring more detailed information on these and newer uses for styrene. You can also depend upon rapid delivery from the CARBIDE warehouse in your area.

In addition—CARBIDE also produces nearly fifty monomers including vinyl acetate, acrylonitrile, and butadiene — each with a variety of profitable applications.

In Canada: Carbide Chemicals Sales Company,
Division of Union Carbide Canada Limited, Toronto.

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SPECIALTIES . . .

new 24-page technical booklet on properties and uses of the insect toxicant, Thanite.

• Magnus, Mabee & Reynard, Inc. (New York) has a new 24-page catalog of its essential oils.

Silicone Resin: General Electric has brought out a silicone resin, designed for the paint industry, that's reported to combine heat resistance with a high balance of cure speed and hardness. Name: SR-111.

Triple Decals: The Meyercord Co. (Chicago) now sells three new types of heat resistant decals for industrial application, Types HR, SHR and HHR. Special adhesives are not required since the decals are water immersed and hand applied.

Electrocleaner: Pennsylvania Salt Mfg. Co. has introduced a new, heavy-duty electrocleaner known as Pennsalt Cleaner K-8. It is a granular, anhydrous product recommended for use on steel and copper.

Mite Enemy: Naugatuck Chemical Div., U.S. Rubber Co., says that Aramite will knock out poultry mites, when sprayed in poultry houses. Each gallon of the product will cover 300-500 sq. ft.

Tenth: According to a survey by Permatex Co. (Brooklyn), automotive maintenance chemicals now rank tenth in total volume among all jobber sales of accessories, parts and equipment to the country's service stations.

Expansion: Taylor Fibre Co. (Betzwood, Pa.) is just completing a \$1,750,000 expansion program. The firm, producer of polyester glass materials and vulcanized fibre laminated plastics, says the move will increase productive capacity more than 50%.

Florida Addition: Coleman-Evans Wood Preserving Co. is building a \$150,000 plant in Jacksonville, Fla. for chemical treatment of railroad and industrial timbers. It is expected to be completed sometime next month.

Soldering Aid: Alkanolammantium salts of alkyl benzene sulfonic acid, along with an excess of the alkanolamine go into a new soldering flux composition patented (U. S. Pat. 2,687,362) by Tennessee Corp.'s Walter Rueggeberg.

Deadly Bait: Assigned to the d-Con Co., Inc. (Chicago), is a recently

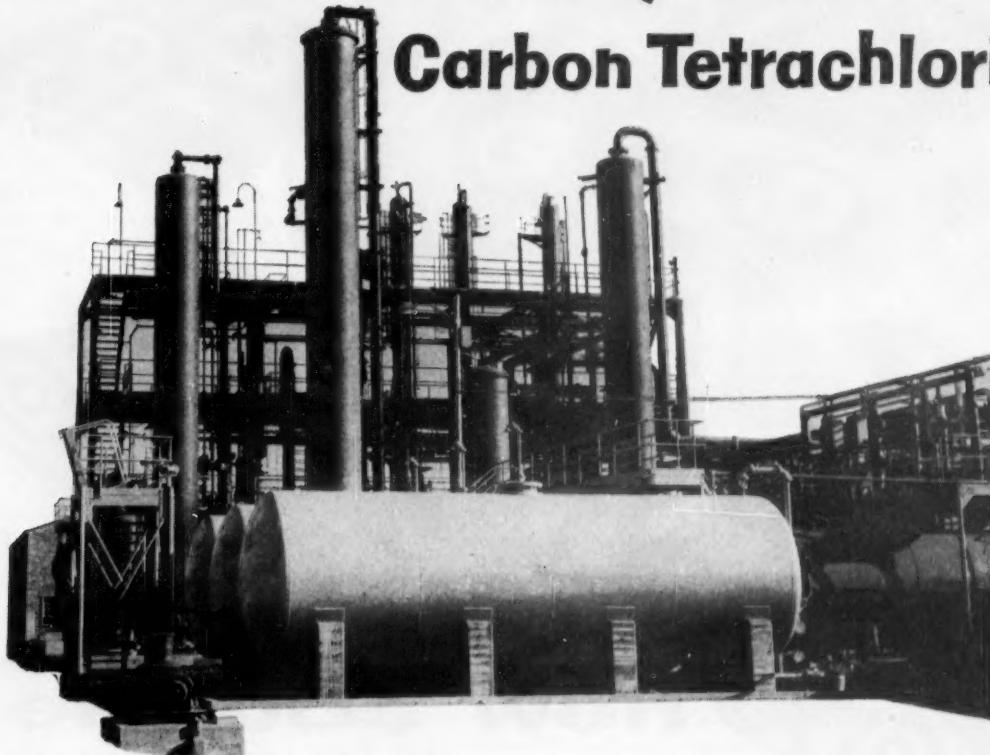


Methylene Chloride

Chloroform

Methyl Chloride

Carbon Tetrachloride



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If you would like to examine or test samples of SOLVAY's new production of Methylene Chloride (either technical or paint remover grade), Chloroform or Carbon Tetrachloride, drop us a line on your letterhead. We will be

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Para-dichlorobenzene • Ortho-dichlorobenzene • Chloroform
Methylene Chloride • Carbon Tetrachloride • Methyl Chloride



Grace Nitrogen Adds

3 new counties to America's farmland

Opening this fall in Memphis, Tennessee, is a plant which will produce 72,000 tons of nitrogen annually in the form of urea and anhydrous ammonia. That's enough nitrogen to boost America's corn production by more than 50 million bushels — it's like adding three counties of rich farmland to the nation.

Corn is only one example. Actually, there will be many applications for this nitrogen: as fertilizer for other crops, as a protein source for feed supplements, and for industrial uses like the manufacture of plastics, synthetic fibers, and pharmaceuticals, and in petroleum refining.

The Memphis plant's output provides agriculture and industry a *dependable* source, backed by a world of experience.

FOR UREA AND AMMONIA LOOK TO



GRACE CHEMICAL COMPANY

HANOVER SQUARE, NEW YORK, N. Y. • ATLANTA, GA. • CHICAGO, ILL. • MEMPHIS, TENN.

SPECIALTIES . . .

granted patent (U. S. Pat. 2,687,365) by Karl Paul Link, concerning warfarin-impregnated rodenticide bait composition. One form of the bait devised is coated with corn syrup to enhance taste appeal to rats.

Aspirin Booster: A new analgesic composition has been worked out by Joseph Seifter for American Home Products Corp. It contains aspirin, along with a nontoxic salt of N methyl-omega-phenyl tertiary-butyl amine, which is said to increase the analgesic effect (U. S. Pat. 2,687,366).

Water Shedder: Silicones for waterproofing masonry are covered in a new patent (U. S. Pat. 2,683,674) by Allied Chemical & Dye. The method involves putting a 5-35% by weight solution of a silanol on the surface, at a dosage rate of one gallon for 25-125 sq. ft.

Polish with a Wallop: There's more than a shine in the liquid polish worked out by Raymond Kennedy, Sioux City, Ia. (U.S. Pat. 2,687,964). His formulation, basically petroleum oil, whiting, and liquid wax, also has about 5% chlordane to give it insecticidal qualities. USDA views on such a product aren't known.

Scratch Remover: Another combination polish is one designed to remove blemishes as well as to add luster to furniture. Jesse Marshall (Tacoma, Wash.) devised the formulation (U.S. Pat. 2,687,963). The polish contains paraffin oil, wax, varnish, lacquer, shellac, lacquer thinner, a lower aliphatic alcohol (1-6 carbon atoms) and a naphthenic base oil.

Modified All: Spray-dried All, the Monsanto low-sudsing detergent, is on the market now. Declared to be identical to the previously offered product, which will still be offered—"extra fluffy" All comes in a bigger box than "concentrated" All. Most of the competitive low sudsers, designed for automatic washers, are spray-dried, and the new move is deemed one to improve appeal of the product to the housewife. The 19-oz. box sells for 33¢; the 3-lb. size for 79¢.

Monsanto, incidentally, recently received a patent (U.S. Pat. 2,683,692) on nonfoaming surface-active compounds. The work of Jay Harris, the patent concerns the use of alkylbenzene sodium sulfonate along with an acetic acid salt of a monoalkylamine.

BACKGROUND: PHOTOMICROGRAPH
OF A LAYKOLD ASPHALT EMULSION

No lower cost multi-purpose emulsions are available to industry. Laykold Asphalt emulsions are being used as additives, extenders, adhesives, binders, coatings and sizings.

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to lower base material costs
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You can order asphalt emulsions hard or soft, ductile or "short", viscous or thin, tough or brittle.

THESE USERS ARE SAVING MONEY

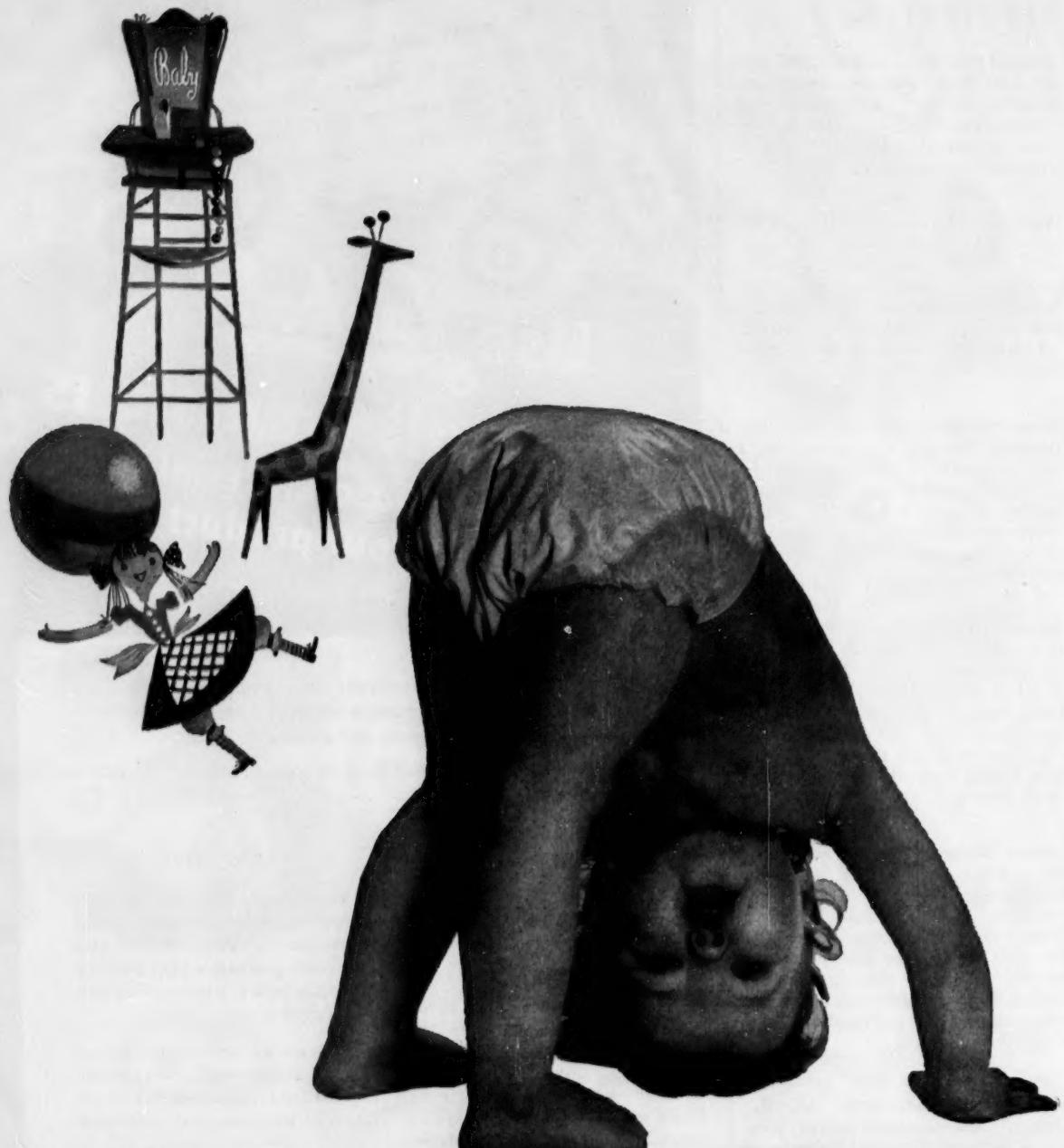
1. Special plywood resin glue was very expensive. Extension with an emulsion cut the cost without serious loss of holding power.
2. Special asphalt emulsions of unusual stability are used in compounding undercoaters and sound-deadeners.
3. A new light-weight building material was bulked with a Laykold emulsion, giving added insulation and water-resistance at low cost.
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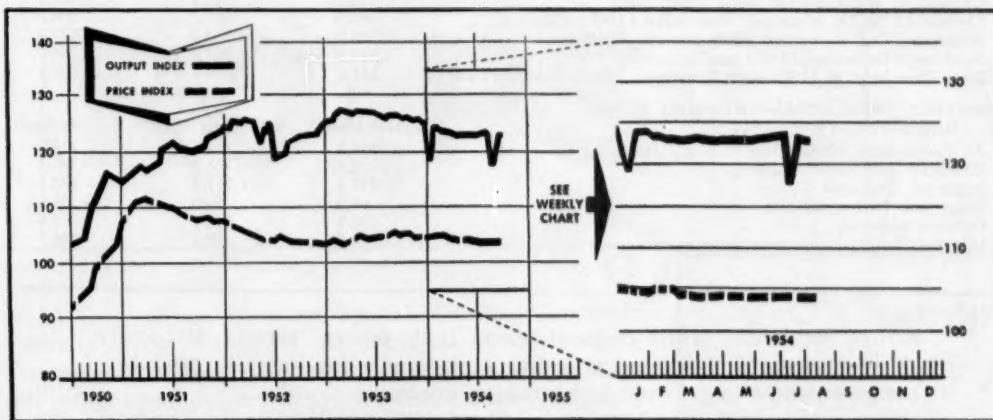
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M A R K E T S



MARKET LETTER

Price changes in both directions, these past few weeks, have done much to stir up fall buying briskness. For example, caustic soda derivatives stepped a little livelier as contract customers squeezed under the Oct. 1 wire set for tipped-up tags.

The same date—and reason—is behind the flurry of inventory buying among glycol, ethylene oxide and ethanolamine users. Although spot mono-, di- and triethanolamine have been selling at the higher level since early August, consumers with contracts will start paying these 1½¢/lb.-boosted prices this week: respectively for the three ethanolamines, 25¢, 24½¢, 21½¢/lb. All are tanks, delivered-in-the-East rates.

On the other hand, some plasticizer sellers are certain that recent official-schedule reductions have brought errant bargain-hunting customers back into the fold. Movement of diisooctyl phthalate (DIOP) and, to some extent, of dioctyl phthalate (DOP) has perked considerably.

All sellers, however, are not yet quoting the lower 30½¢/lb. Producers adhering to the previous level—evidently heartened by the upturn in business—see no immediate reason for changing. The lower-quoters, though, expect that their price will prevail.

Prices on some paintmaking ingredients continue to move higher. Nudged by the hardening trend in pig lead prices, major lead oxides underwent their third advance in nearly as many weeks. At the moment—and there's no guarantee the spiral will level off—95% dry red lead is up to 17½¢/lb., c.l., 17¾¢ for l.c.l. lots. Litharge also notched up another ¼¢/lb., is currently selling for 16½¢, c.l., and for a half-cent more than that l.c.l. New l.c.l. price for orange mineral is 20.35¢/lb.

There's a contrast in liquid shellac, though. Prices are reportedly pegged pretty firmly, bolstered as they are by this combination of factors: current strength in alcohol; mounting costs of gum; accelerated consumption as the fall season gets under way.

Pricewise, alcohol has come half-circle from the softness of a few months ago. Price schedules are firm and steady with no sign of the

MARKET LETTER

WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	123.2	123.1	126.3
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.0	104.2	104.9
Bituminous Coal Production (daily average, 1,000 tons)	1,329.0	1,283.0	1,620.0
Steel Ingot Production (1,000 tons)	1,588.0 (est.)	1,583.0 (act.)	2,144.0
Stock Price Index of 13 Chemical Companies (Standard & Poor's Corp.)	324.4	318.8	240.8

MONTHLY INDICATORS—Wholesale Prices (Index 1947-1949=100)

	Latest Month	Preceding Month	Year Ago
All Commodities (Other than Farm and Foods)	114.4	114.3	114.9
Chemicals and Allied Products	106.8	106.7	106.3
Industrial Chemicals	117.4	117.1	120.2
Drugs and Pharmaceuticals	94.0	94.0	93.5
Fertilizer Materials	112.1	112.1	113.8
Oils and Fats	53.5	52.0	46.7

earlier weakness, while demand—from both general solvent and other chemical outlets—is bouncing along at a good clip. Fact is, producers expect business to get even better during upcoming months.

It's another case of a price drop fulfilling sellers' hopes. The late-spring 3¢/gal. slash evidently resparked buyers' interest. Worrying consumers now is the question whether alcohol sellers consider business good enough for a slight increase. There's no definite indication that this will happen, but producers are watching order books closely, assessing such a move.

The possibility is stronger that some naval stores prices will again be altered upwards, as they were a couple of weeks ago when local prices were advanced 5¢ to 20¢/cwt. With sales of both gum rosin and turpentine continuing in good volume, the fact that the industry is running into its nonproducing season is seen as a more-than-likely hiker of current schedules. Goodly quantities moving into exports, too, are lending a tightening influence.

But the firmness is not confined to gum alone—demand for wood rosins is also at a high level.

The acetone market, too, is in a far better state than it was earlier this year. By this week, signs of once-prevalent under-the-counter pricing activity are singularly absent; manufacturers' quotes—8¢/lb., tanks—show no deviation.

Solvent demand throughout the summer has been fairly well sustained, and, as with alcohol, chances are that the autumn months will bring even more improvement. There's no danger, though, that demand will soon reach the stage where current supplies prove inadequate—there are ample stocks and capacity to forestall any foreseeable tightness.

Long-term prices of pulp and paper products will remain constant relative to prices of competing materials, says Stanford Research Institute's just-out report for the Weyerhaeuser Timber Co., Tacoma, Wash.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending Sept. 20, 1954

UP

	Change	New Price		Change	New Price
Mercury, metal, 76-lb. flask, net flask	\$ 15.00	\$320.00	Sodium stannate, dms., works, frt. alld. E.	\$.004	\$.548
Potassium stannate, dms., frt. alld. E.	.004	.682	Stannic chloride, anhyd., dms., works	.005	.762
Sodium chloroacetate, tech., dms., c.i., works	.03	.27			

All prices per pound unless quantity is stated.

Versatile New Structure

(RO)₃PS

BASED ON THIS GENERIC FORMULA, Virginia-Carolina Chemical Corporation is now producing *O,O,O*-trialkyl phosphorothioates, a new series of stable, pentavalent phosphorus esters with unique chemical and physical properties which indicate various highly-promising applications. Now available in limited commercial quantities:

O,O,O-Triethyl Phosphorothioate

O,O,O-Tributyl Phosphorothioate

O,O,O-Triisooctyl Phosphorothioate

These neutral esters of phosphorothioic acid are somewhat similar to trialkyl phosphates but with a significant structural difference in that oxygen is replaced by the semipolar sulphur atom, resulting in decreased toxicities, greater thermal stabilities, higher boiling points, higher refractive indices, higher specific gravities, lower water solubilities and more diversified solubilities in organic solvents.

This interesting group of compounds is so new that a detailed evaluation of commercial applicability is not yet available. Suggested fields of usage: additives to extreme pressure lubricants; anticorrosion agents; antifoam agents; specialty solvents; hydraulic fluids; plasticizing agents for cellulose esters, synthetic resins and GR-S rubber; and intermediates for organic synthesis.

Samples of phosphorothioates and a brochure are available without charge. Simply request these on your company letterhead.

Basic In Phosphorus

THE BASIC POSITION of Virginia-Carolina Chemical Corporation in phosphorus and its growing family of useful compounds is the result of nearly a century of progressive pioneering, including this country's first mining of phosphate rock in 1868 and first commercial production of phosphoric acid in 1907.

The greatest V-C growth in phosphorus has occurred in recent years. V-C phosphate mining activities have been steadily expanded and thoroughly mechanized. New V-C furnaces for producing elemental phosphorus are among the most modern now in operation.

V-C has five phosphoric acid plants and is the only manufacturer of phosphoric acids both by the

"wet process" and by phosphorus conversion. Other V-C facilities yield phosphoric anhydride, sodium orthophosphates and sodium polyphosphates, phosphatic specialties, and sodium metasilicate.

A V-C organophosphorus plant is in large scale production of alkyl phosphites, phosphonates, phosphorothioates, and other new organics. A semi-works unit is pioneering with new and highly promising chemical groupings based on phosphorus.

Enterprising research and progressive development are V-C traditions, constantly improving present products and processes, creating new products for new uses, opening new frontiers for chemical progress.

V-C Chemicals

Phosphorus, Elemental
Phosphoric Acids
Phosphoric Anhydride
Disodium Phosphate
Trisodium Phosphate
Sodium Tripolyphosphate
Tetrasodium Pyrophosphate
Dimethyl Phosphite
Diethyl Phosphite
Triethyl Phosphite†
Triisooctyl Phosphite†
Diethyl Ethylphosphonate
Tetraethyl Pyrophosphate
Sodium Metasilicate
Ferrophosphorus
Slag
Phosphorus Trichloride
Phosphorus Oxychloride
Uranium Oxide
Di- and Trialkyl† Phosphites
Phosphonates and
Diphosphonates
Phosphorothioates and
Phosphorothioites
Alkyl Aryl Phosphites
Alkyl Acid Phosphates
and other organophosphorus
compounds and phosphatic
specialties.

†Mfd. under U.S. Pat. 2,678,940



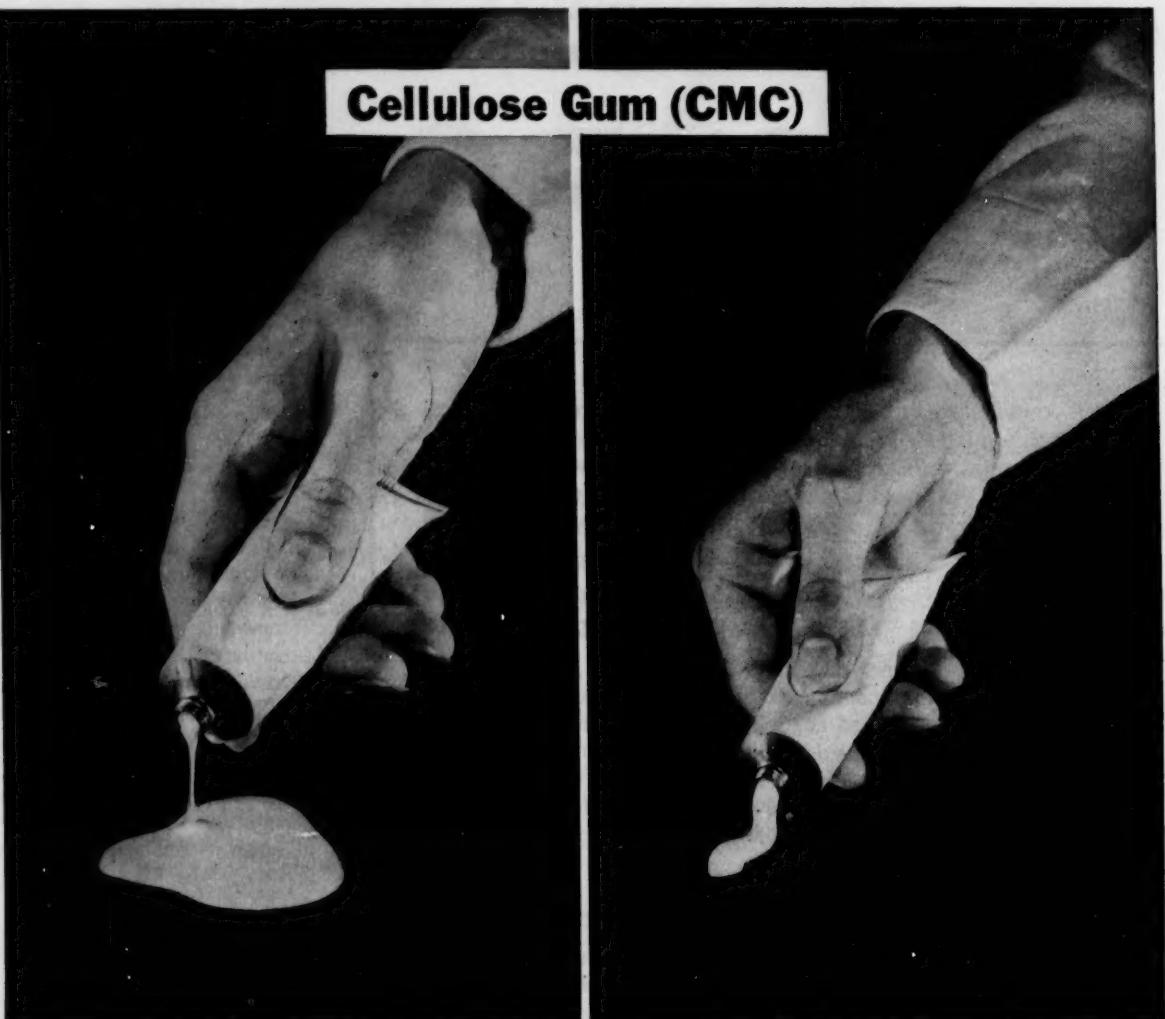
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*Reg. U. S. Pat. Off.

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Chemicals Division: 401 EAST MAIN STREET, RICHMOND 8, VIRGINIA

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Cellulose Products Department

HERCULES POWDER COMPANY

INCORPORATED
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CM54-10

MARKETS

MARKETS

BDSA Benzene* End-Use Pattern 1950-1952

(Millions of Gallons)

	1951	1952
Production	240 ⁽¹⁾	225 ⁽²⁾
Imports	16 ⁽³⁾	36 ⁽⁴⁾
Supply—Total	281	261

A report is required under Section 705 of the Defense Production Act of 1950, as amended.

DDA FORM 357a
G-7-341

U.S. DEPARTMENT OF COMMERCE
BUSINESS AND DEFENSE SERVICES ADMINISTRATION

BENZENE:

CONSUMER'S REPORT ON USES

To: Business and Defense Services Administration,
Washington 25, D. C.
ATTN: Chemical and Rubber Division

INSTRUCTIONS

Prepare and return one (1) copy of this report to the above address by October 11, 1954.

PLANT LOCATION - At the option of the company, the uses shown in Section I may be reported from plant location or from combined -

Section I - (Intermediate use) - Columns (c) and (d) - If one of the listed items is made and used or purchased and used as a material in the production of another listed item, specify such intermediate item in column (c).

Location

1953

Plant Location (See Instructions)

LATEST QUERY: BDSA again tags benzene to lead the way.

Straight Answers Will Help

By this week some 150 leading U.S. producers and consumers of benzene will be pondering a new, long-heralded, government questionnaire. After eight months' effort, the Chemical and Rubber Division of the Business & Defense Services Administration finally received approval to go ahead with the first of about 125 "key" chemical follow-up surveys, last week had mailed the benzene probe forms. High on the priority list of chemicals slated for similar treatment (but not necessarily in the order given) are argon, phosphorus, hydrogen peroxide, methanol, formaldehyde, toluene, vinyl resins and polyester resins.

The data now being sought on benzene cover capacity, production and consumption by specific end uses for this year and last. When correlated with BDSA's original* benzene pattern for 1950-52 (CW, Jan. 2, p. 45), the latest information will probably play a significant part in forecasts of military and essential civilian demands. An added agency hope: the survey will be an accurate guide-rule for allocating materials in time of emergency.

Results of the benzene analysis, as well as of those to come, are intended primarily for the government's own

chemical mobilization files. But market researchers, sales managers and other interested industry followers will get a crack at much of the material gathered; the line will be drawn only through confidential information that might disclose individual company operations.

Target date for release of the '53 benzene figures is tentatively set for late November, but there may be some delay; it depends on how long BDSA takes to merge the '50-'52 data with the new.

One a Week: The agency plans, after it gets into the survey swing, to turn out one a week. Thus, the last on the list of 125 projected would be completed by the end of 1956.

One of BDSA's big questions regarding future surveys: whether to look at end use patterns by distribution or by consumption. For instance, it would be considerably easier to survey 50 producers concerning their end use distribution of, say, caustic soda, than to tabulate replies from some 4,000 caustic consumers. Then, too, there's the problem of just compiling a complete list of customers for any specific chemical.

Another point to be weighed is whether or not the producer or the consumer has a more accurate idea of what a pattern should be.

But these factors shouldn't appreciably upset BDSA's timetable now that the way has been paved by the benzene surveys. Work on preparing the market analyses began following approval of the plan by the Chemical and Rubber Advisory Committee last December. Since February of this year, the project has received an o.k. not only from top BDSA and Commerce Dept. officials, but also from the Bureau of the Budget. The latter, before affixing its go-ahead stamp, submitted the survey forms to its industry advisory group and also spot-checked benzene makers and users to see that such reporting would not entail undue hardship.

What Now? The benzene questionnaire is a two-part affair—one for makers, who are asked to report on capacity, output, by-products and raw materials; the other for users' reports on outlets.

The fifty-odd U.S. producers' replies will cover nitration benzene (1 degree), industrially pure (2 degree), motor and other grades. They will detail the following:

- Production, on a 24-hour/day, 360-day/year basis for calendar 1953, from every source other than imports and coke ovens. (Accurate figures for these materials are collected by the Tariff Commission and the Bureau of Mines.)

- Estimated production during the current year of facilities onstream before Jan. 1, '54, and those that will be completed before Jan. 1 of next year. Annual rated capacity is asked for these plants as well as for those authorized or under construction and that will be producing after Jan. 1, '55.

- Coproducts, such as toluene, xylene, are to be listed, though quantities need not be reported.

- Unit of measure, grade and amounts should be specified on various raw materials consumed. These include crude benzene, hydroformate, sulfuric acid, aromatic distillate and gasoline (but not catalysts).

Benzene users—nearly 100 of them—will round out the end use picture, give the number of gallons of benzene needed for some 17 specific outlets: phenol, styrene, aniline, maleic anhydride, DDT, synthetic detergents, benzene hexachloride, di- and monochlorobenzene, nitrobenzene, biphenyl, ethylbenzene, synthetic fibers, ethyl alcohol denaturant, motor gasoline, paint remover, solvents, and other uses.

Too, the government is trying to get an estimate of the various methods

* First in a series already covering (in addition to benzene) sulfuric acid, toluene, sulfur.

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AREA DEVELOPMENT DEPARTMENT

VIRGINIA ELECTRIC AND POWER COMPANY
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M A R K E T S

of turning out these 17 items, some of which utilize others as intermediates. For example, a company producing monochlorobenzene for use in phenol production (rather than working directly from benzene by sulfonation) would report the quantity of benzene used to make the monochlorobenzene, and also indicate the amount of this intermediate consumed to make the phenol.

Benzene Spotlight: Although the correlated reports are tabbed an aid for the future, they may well serve to assess the current benzene supply/demand situation. And, as some harried marketers are putting it, "benzene sure needs it."

On the surface it would appear that the market is breezing along "in balance," with even some tightening of supply here and there. Demand for the material has been stepped up over the past few weeks, and the improvement is expected to continue. Big-time benzene users—e.g., phenol and plastics—will likely increase their take during the next month or two. All in all, it's a blue sky for benzene.

But at the moment all isn't bright. Coal-tar benzene producers are selling all they're making, but their output has continued to skitter. Reason, of course, is the cutback in steel output, with its concomitant braking of coke-oven operations.

Even so, benzene demand is so slow that petroleum-derived benzene is barely moving. For instance, none is today coming out of Shell's Houston installation. The plant worked at 100% capacity until stocks backed up, was then shut down. With the curtailment Shell's operations for the year will average out to about 50%. The story at Standard of Indiana's Whiting plant is almost identical. (On the other hand, a newer entry into petro-aromatics is reportedly making benzene, though at lower than capacity level, and selling a good deal of it—but at buyer-enticing prices.)

Further emphasizing the current slow-down is the fact that some major benzene buyers are reduced to peddling (at cut-rate prices) the material it must accept on a take-it-or-pay basis embodied in long, strong contracts with exclusive suppliers.

But dips and surges are not alien to the benzene supply/demand curve—it may be down today, will certainly climb tomorrow. Most provocative poser facing the field at the moment is this: will BDSA's labors help to level the traditional peaks and valleys? The answer may well lean heavily on industry's response to the government's probe.



COATING OVER: Part of a lusty multimillion-dollar spread.

Latex Bumping

Though not often bubbling to the surface, keen competitive currents continue to swirl in the paint market. How strongly the undertow has affected some "wonder" coatings is pointed up by a recent analysis of latex paints.

Demand for these types is reported to have reached a peak, and from here on in the trend will be downward. Principal factor: the continuing counterattack of resin and solvent makers.

Oil-base coatings and resin-emulsion water paints—the latter widely used during World War II—have been nudged hard by butadiene-styrene emulsions since their introduction in 1948. In less than half a decade, they have come pretty close to cornering 40% of the market.

As late as mid-1953, estimates had pegged last year's consumption at an impressive 40-million-gal./year rate. But now, Titanium Pigment Corp.'s Fred Stieg told a Devoe & Reynolds sales management forum recently, a reliable store audit indicates that sales actually hit some 5 million gal. less than that.

This year, demand for the latex paints will probably exceed 35 million gal.; but thereafter, he believes, con-

sumption will slip to a plateau of about 30 million gal./year.

The decrease in importance of latex paints is traced to the fall of 1952 when odorless alkyls, as well as acrylics and polyvinyl acetate copolymers (CW, Aug. 29, '53, p. 59) began to exert pressure on the rubber types.

Exterior latex paints, Stieg feels, will in the future be limited to use on cement, stucco and asbestos shingle, will not be used significantly on wood.

Titanium, Too

Speaking before the same sales forum (CW, Sept. 18, p. 72), Du Pont's Dr. William Lusby, Jr., of the Special Products Division, cited the expanding national defense demands of titanium metal. He stated, however, that the increase in requirements—something like an annual demand of 150,000 tons, largely for use in high-speed aircraft—will not cut into the supply of titanium dioxide pigments used in surface coatings.

Commenting on sources, Dr. Lusby pointed out that the North American continent possesses adequate mineral reserves to supply "estimated needs" for the metal as well as a sizable output for the pigment business.

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- asym.-Methylphenylhydrazine
- N-Methylpiperidine
- 6-Methylpyridine-2-aldehyde
- 5-Methylpyrimidine
- N-Methylpyrrolidine
- α -Methyl 1-Rhamnoside
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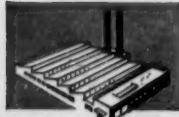
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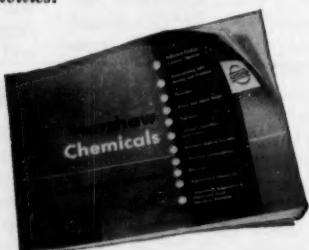
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RESEARCH . . .



LIBRARIAN DUCA: For New York chemical makers, her well-stocked shelves mean . . .

Money in the Bank

"Of making many books," wrote the wise and cynical author of Ecclesiastes, "there is no end." That was before the day of scientific papers, or he certainly would have included them, too, in his dolorous comment.

The immutability of this flood is best appreciated by chemical literature specialists, who last week, at sessions of the American Chemical Society's Division of Chemical Literature, presented 56 papers on various facets of the same central problem: how to cope with it.

No one expects any diminution of the words-per-second flow rate of published material. Both U.S. and foreign research is quickening in tempo—and research inevitably adds to the flow. Just as inevitably, research requires keeping posted—knowing what others have done and are doing, reading their papers and texts, combing the literature for leads.

To this end, researchers can call on an army of new books and periodicals. But, with library space costly—and sharply limited in most small and medium-size companies—it's not practical for the average firm to assemble all the scientific literature pertaining to its field.

Instead, the economy-conscious research director now depends in large



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measure on independent technical libraries.

A standout among such repositories is the library at New York's Chemists' Club. On its shelves are more than 200 different periodicals—about half of which are foreign. Backing up this array is an active collection of over 50,000 scientific texts.

It's one of the most complete collections of chemical literature in the world—one in which Russia's *Zhurnal Prikladnoi Khimii* (Journal of Applied Chemistry) coexists with such Western

members as Argentina's *Industria y Química* and the *Journal of the American Chemical Society*.

Since the library is open to the public during regular business hours, its resources are freely available to researchers in the New York area.

But out-of-towners benefit, too. For those not equipped to translate foreign papers, the library locates translators. It also provides—for a moderate fee—photostats, microfilms (periodicals are never loaned out) and does comprehensive literature searches. (Simple telephoned or written requests, that can be satisfied with information at hand, are handled at no cost.)

Detailed information on a variety of subjects can be gleaned from the library's special files. These include: a collection of chemical market statistics; a file of more than 5,000 biographies of prominent chemists and engineers; over 2,500 pictures of chemical men; histories of scores of chemical companies; and a listing of past winners of awards (e.g., the Perkin medal) presented by companies, societies and groups within the chemical industry.

Librarian Anne Duca and two assistants keep the files up to date, carefully cull items from a bevy of business news sources in addition to their other traditional library chores.

Owing to its completeness as a chemical reference center, the library often mirrors important technical developments in the chemical industry. The advent of isonicotinic acid hydrazide TB drugs, for example, was heralded by a rush of requests for an obscure paper* on its synthesis.

But even during relative lulls, the library—just by carrying on its normal functions—is busy providing a service that's money in the bank to a host of chemical businesses.

* Published in 1912 by Austrian chemists Hans Meyer and Josef Mally.



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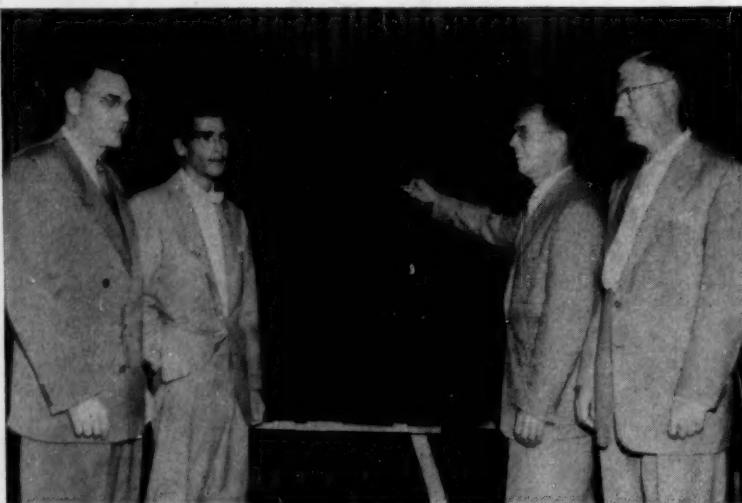
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RESEARCH



DPI'S VITAMIN A PROBERS*: Plenty of interest in their active isomers.

New Twist in Vitamin A

Any notion that vitamin A synthesis is a pat procedure and lacking in research interest was dispelled this week as Distillation Products Industries division of Eastman Kodak (Rochester, N.Y.) unveiled a brand-new way to make the compound.

Thus far, DPI has used the technique to make five different geometric isomers of the vitamin, later evaluated these for comparative biological activity.

The quintet includes *trans*-vitamin A acetate (the commercial form and international standard), *neo*-vitamin A (the 2-*cis* isomer also found in fish liver oils), and three new isomers, the 6-*cis*, 2,6-di-*cis*, and 2,4-di-*cis* forms. From a bio-assay standpoint, the *trans*-isomer was found to have the highest activity, 25% more than *neo*-vitamin A, and five times the efficacy of any of the three newcomers.

While this disclosure will make producers of commercial vitamin A rest easier, it doesn't preclude an eventual market for one of the newer forms if they're later shown to have specialized uses. Studies at the University of Rochester medical school, for example, turned up the fact that victims of celiac disease (inability to assimilate fats) can't take vitamin A in the ester form, must have it as the alcohol or aldehyde.

Salient Features: While the biological significance of the new isomers is still clouded, there's no discounting

the potential impact of the new synthesis on the manufacture of regular vitamin A. Although DPI is mum on commercial possibilities (points out that its brainchild is still in the lab stage and yields are low), some salient features of the new technique are piquing the interest of pharmaceutical men. For one thing, the method is said to be unique in its ability to form single, unmixed, stereoisomers of vitamin A, completely eliminating costly separation steps. In addition, it's a novel way to lengthen any carbon chain by four carbons, may have interest outside of the drug field in the preparation of insecticides and terpene derivatives.

Key to DPI's reaction is methyl β -methylglutaconate, which is condensed with β -ionylideneacetaldehyde. The resulting 4-carboxy-vitamin A acid is then decarboxylated, and an ester of this product reduced to the vitamin A alcohol with lithium aluminum hydride.

But there's still one link with the past in DPI's synthesis; and that's the use of β -ionone as a starting material. Ionone is derived from citral, which in turn comes from lemon grass oil—raw material for most synthetic vitamin A output. Even this dependence on natural sources could be eliminated if synthetic citral becomes reality. Right now, there's talk that Hoffmann-La Roche has a working synthesis for citral, although the firm would neither confirm nor deny the rumors to CW. Of course, the citral market extends beyond vitamin A needs, is important

*L, to r.: Stanley Ames, John Cawley, Charles Robeson, Grove Baxter.

in the toiletry and perfume industries.

Not content to confine their studies to vitamin A esters, DPI researchers followed through on the corresponding geometric isomers of the aldehydes. They discovered that *trans*-vitamin A aldehyde and its *2-cis* isomer have equal biological activity—about 90% that of regular vitamin A. Aldehydes with the *6-cis* and *2,6-di-cis* bonds have only one-fifth of this potency. But the *2,4-di-cis* aldehyde (also named neoretinene b) turned out to be one-half as active as the standard vitamin and was identified as a component of the light-sensitive pigment of the human eye.

Chemical characterization of the isomers was based on ultraviolet absorption, infrared spectra, and physical and chemical properties (e.g., reaction with maleic anhydride). According to DPI's research director, Norris Embree, all the new compounds will be henceforth listed in U.S. *Pharmacopeia* along with the official description for vitamin A.

Right now the new products are an unknown commercial quantity. But it's a cinch that drug chemists will be toying with the new reaction for some time to come, on the theory that any synthesis that's 100% controllable is worth a long, hard look.

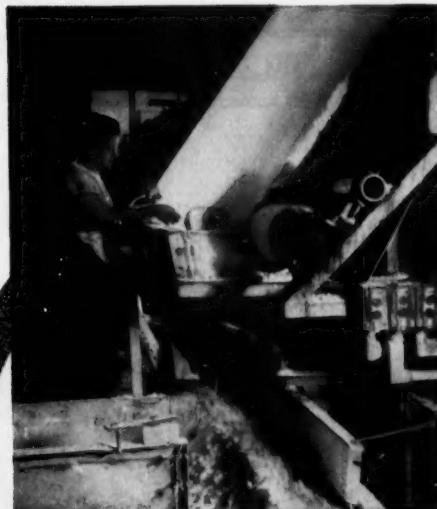
Boron Out of the Bag

One of the best kept secrets in the chemical industry became a matter of record last week with the introduction of Standard Oil Co. of Ohio's new "Boron Supreme" gasoline. First to utilize a boron additive, the new fuel is the product of several years' research and road evaluation.

Everyone knew that Sohio was interested in boron additives (*CW*, April 7, '51); but few if any suspected that the company was ready to launch one into the rough-and-tumble gasoline market.

Even now, the picture is far from being thoroughly clear. The exact identity of the boron additive has not been revealed. Sohio research director Everett Hughes admits that it is an organic material manufactured within the company. Also known is the fact that Sohio chemists have carefully screened a series of borines, apparently with unrewarding results.

Even with the aid of a crystal ball, it's doubtful that the mystery-shrouded chemical could be deduced from these meager clues. Sohio has applied for a patent on the material, however, will license it to all comers. Moreover, at some future date, it's not inconceivable



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OXALIC ACID

RESEARCH

that manufacture of the compound will be given over to a chemicals producer.

The publicity-shy boron compound is now made at Sohio's No. 2 Cleveland plant, a lube oil production unit, which has largely been superseded by the firm's big new Lima refinery.

Sohio is considerably less reticent, however, about discussing performance of the boron-bearing gasoline.

According to test results, the new gasoline gives about 5% more mileage/gallon than control fuels (without boron), reduces piston ring wear up to 45%, cuts engine deposits and resulting preignition, and markedly increases operating smoothness.

Moreover, there is said to be no problem of boron residues. Volatile with steam, the boron additive is almost completely eliminated from the cylinders. Less than 0.1% was reported to be retained after driving tests.

Long Haul: Field evaluation of the boron fuel was conducted by Southwest Research Corp. (San Antonio), nationally known engine- and gasoline-testing concern. Over 240,000 miles of driving were racked up on the Pennsylvania Turnpike alone, using six different kinds of new cars.

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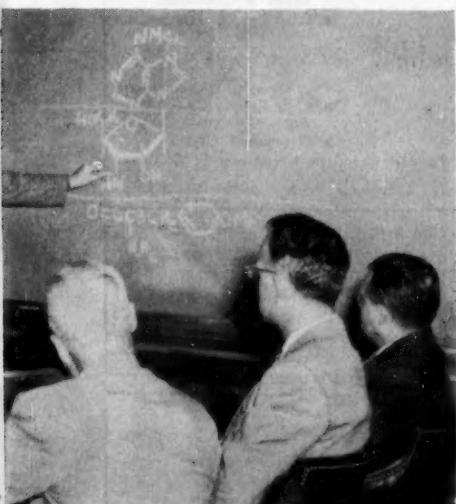
New Antibiotics'

IF THE HOPES of Lederle Laboratories' (division of American Cyanamid Co.) James Williams (standing) materialize, the chemical structure shown on the blackboard may go down as the master pattern from which a spate of valuable new antibiotics will be tailored. That message was made unmistakably clear last week when the Lederle researchers (shown above) headed by Williams, revealed the results of their work with Puromycin.

Aside from its role as a substantial new outlet for boron chemicals, the new gasoline is significant to the chemical industry as an antiknock anomaly. Unlike almost all of its auto fuel contemporaries, Sohio's "Boron Supreme" uses aviation antiknock fluid. Formulated entirely with ethylene bromide (regular antiknock fluids utilize equal parts of bromide and chloride), the aviation fluid reportedly gives rise to less acid formation, less engine wear than ordinary automotive TEL.

Just how boron exerts its beneficial influence in the engine is still a moot point. As a matter of fact, researchers are not absolutely sure that the boron is the chief reason for all the improvements noted. For one thing, test results were obtained using new cars. How much good the new additive will do in older engines is something to be considered.

Another item up for study is the smoothing influence the new gas exerts on engine operation. Believed to be tied up with rate and nature of combustion in the cylinders, this effect is under investigation by a Sohio-sponsored group at Battelle Memorial Institute (Columbus, O.).



Master Pattern?

(CW, Sept. 4, p. 69). Tops among their achievements is the total synthesis of the complicated antibiotic; but following closely is the discovery that slight alterations of the compound's structure could enhance its activity along desired lines. Still in the experimental stage, Puromycin shows activity against African sleeping sickness, also certain other cancers and infections.



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RESEARCH

Hopeful Threesome

Three new developments had industrial research people sitting up and taking notes at last week's New York national meeting of the American Chemical Society.

• New fluorocarbon surface-active agents out of Minnesota Mining and Manufacturing Co. (St. Paul) were revealed to be covetously eyeing applications in the petroleum industry. According to 3M chemical engineer George Blake, the ambitious new chemicals can function as a kind of blanket over stored gasoline and oil, reduce evaporation, fire hazard and atmospheric contamination.

The fluorocarbons form an extremely thin, nearly invisible surface film, are effective in this regard in quantities ranging down to 0.002% by weight of the liquid to be covered. Test results are said to prove that such films slow up the rate of gasoline evaporation by as much as 75%.

Other possible uses for the fluorine-bearing surface-active compounds are in insecticide formulations, greases, waxes, paints, cosmetics, etc. Their wetting abilities also suggest potential jobs as ore flotation agents and efficiency boosters in distillation pro-



In New Quarters

A NEW HOME for General Chemical Div. (Allied Chemical & Dye) research was formally opened last fortnight. Situated adjacent to Allied Chemical's central research facilities at Morris Township, N.J., the labs—the one shown (*above*) is devoted to fluorine chemicals—cost \$2 million.

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RESEARCH . . .

esses. Cost, however, is comparatively high, may well be the chief stumbling block to development of any large volume application.

A new synthesis of isoleucine was unveiled by Halbert White of Dow. Said to be "practical and commercially feasible," the procedure starts with readily obtainable fusel oil, a fermentation industry by-product made up of amyl and isoamyl alcohol. Extracted by distillation, the former is the cornerstone of a synthetic procedure that yields only two isomers—L-isoleucine and D-alloisoleucine.

From this point, it's relatively simple to get the nutritionally active L-isomer, whereas older methods yield a hard-to-resolve mixture of four isomers. L-Isoleucine, an amino acid essential to proper human nutrition, may be useful in supplementing food-stuffs and livestock feeds.

Boron trifluoride gas bowed in as a possible new sludge cutter for gasoline. Gulf Research & Development Co.'s Harold Beuther reported that small amounts (less than 0.1% by weight of gasoline) of the chemical substantially reduce sludge formation in storage, do not appreciably affect octane numbers of clear or leaded gasoline.

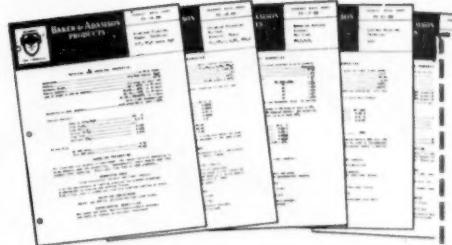
Moreover, claims Gulf, the treatment is simple to carry out, requires neither heat nor pressure, is relatively noncorrosive to refinery equipment. Preliminary economic studies are said to show that the new method costs approximately the same as some comparable procedures currently in use. But many industry people think boron trifluoride has a long way to go before it's competitive with existing refinery sludge-reducing treatments.

Moving On: Union Carbide and Carbon has just abandoned plans for Bay Village, O., as the site of its proposed \$4-million research laboratory. A zoning controversy, prompted by the proposed laboratory, caused a furor in the Cleveland suburb last year. Now the company says it feels that it would be unnecessarily restrictive to undertake a major project where its development might be inhibited.

Coal Probe: The Philadelphia and Reading Coal and Iron Co. is tackling the problem of trying to gasify on a practical commercial scale by-product anthracite silt and slush. The actual experimental work will be carried out in the Trenton (N. J.) laboratories of Hydrocarbon Research, which recently concluded an agreement with the Philadelphia firm. Goal of the work will be to convert the waste into synthesis gas.

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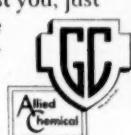
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<input type="checkbox"/> Potassium Fluoborate, Crystal, Purified	DA-41041
<input type="checkbox"/> Potassium Nitrite, Fused, Lump	DA-41361
<input type="checkbox"/> Potassium Thiosulfate, Purified	DA-45521
<input type="checkbox"/> Potassium Titanium Fluoride	DA-41521
<input type="checkbox"/> Sodium Fluoborate, Crystal, Technical	DA-42401
<input type="checkbox"/> Stannous Chloride, Crystal, Technical	DA-43421
<input type="checkbox"/> Zinc Formate, Crystal, Purified	DA-44441

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